



AIR MEASUREMENT SERVICES, INC.

Horizon Test #: W07-039-FRC

Date Tested: April 21, 2004

Report Date: June 8, 2004

Revision Number: 0

**ANNUAL EMISSIONS TEST
OF LANDFILL GAS FLARE #3
BRADLEY LANDFILL**

Permit to Operate Number: F31516

Facility ID Number: 050310

Prepared for:

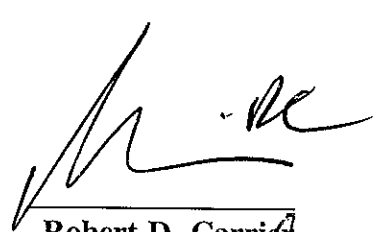
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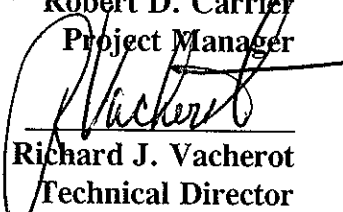
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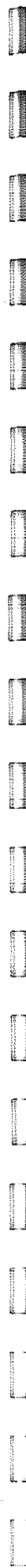
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June 8, 2004

Mr. Bruce Matlock
Bradley Landfill and Recycling Center
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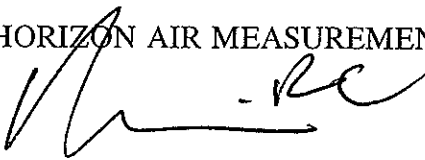
Dear Mr. Matlock:

Please find enclosed three copies of the final report entitled "Annual Emissions Test of Landfill Gas Flare #3 Bradley Landfill. "

If you have any questions please call me at (805) 498-8781.

Sincerely,

HORIZON AIR MEASUREMENT SERVICES, INC.



Robert D. Carrier
Project Manager

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1. INTRODUCTION

Under Condition No. 18 of Permit to Operate No. F31516, Waste Management Recycling and Disposal Services of California, Inc. is required to conduct source test on a landfill gas flare (Flare #3) located at Bradley Landfill and Recycling Center. Horizon Air Measurement Services, Inc. (Horizon) had been retained for this purpose.

All testing/analytical procedures conformed to those outlined in Horizon Test Plan No. W07-011-TP, which had been approved by the South Coast Air Quality Management District (SCAQMD). Horizon completed the source testing on April 21, 2004.

Two samples were taken for each parameter of interest (Table 1-1) with the exception of trace organic compounds and reduced sulfur compounds, for which only one sample per location was collected. The results of the testing program, with respect to Permit limits, are provided in Section 2 - Results Summary.

A brief description of the flare and flare operating conditions during testing is provided in Section 3. Section 4 provides a summary of sampling/analytical procedures utilized. Section 5 provides a more detailed results summary/discussion.

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Table 1-1
Compounds of Interest
Waste Management - Bradley Landfill
Flare #3
April 21, 2004

PARAMETER	LOCATION	METHOD	NUMBER OF SAMPLES PER SOURCE
Total Non Methane Hydrocarbons	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 25.3	2
Reduced Sulfur Compounds (C ₁ -C ₃) Including H ₂ S	Inlet	SCAQMD Method 307.91 Equivalent	1
Speciated Organic Compounds	Inlet	Whole Air/GC-MS (1150 list)	1
	Outlet	Whole Air/GC-MS (1150 list)	1
Particulate Matter	Outlet	SCAQMD Method 5.1	2
Oxides of Nitrogen	Outlet	SCAQMD Method 100.1	2
Carbon Monoxide	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 100.1	2
Oxygen	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 100.1	2
Carbon Dioxide	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 100.1	2
Methane	Inlet	SCAQMD Method 25.1	2
	Outlet	SCAQMD Method 25.3	2
Flow Rate/Temperature	Inlet	SCAQMD Method 2.3	2
	Outlet	SCAQMD Method 5.1/Calculated	2
Moisture	Outlet	SCAQMD Method 5.1	2
	Inlet	SCAQMD Method 4.1	2
BTU Content	Inlet	SCAQMD Method 25.1	2

2. SUMMARY OF RESULTS

The results of the testing program conducted on April 21, 2004 are provided in Table 2-1. Emission rates of oxides of nitrogen, carbon monoxide, total particulate matter, total non-methane organics and total sulfur compounds (as SO₂) were within Permit limitations. A more detailed discussion of results is provided in Section 5.

Table 2-1
Summary of Results
Waste Management - Bradley Landfill
Flare #3
April 21, 2004

Parameter	Measured Emission Rate*	Permitted Emission Rate*
Landfill Gas Flow Rate	1636 dscfm	2083 cfm
Oxides of Nitrogen, as NO ₂	1.11 lb/hour 0.038 lb/MMBtu	2.58 lb/hour 0.06 lb/MMBtu
Total Particulate Matter	0.19 lb/hour	1.31 lb/hour
Carbon Monoxide	<0.93 lb/hour	2.37 lb/hour
Total Non Methane Organics, as CH ₄	0.162 lb/hour	0.66 lb/hour
Total Non Methane Organics, as C ₆	1.74 ppm @ 3% O ₂	20 ppm C ₆ @ 3% O ₂ (Rule 1150.1)
Total Sulfur Compounds, as SO ₂	0.49 lb/hour	3.16 lb/hour

* Measured emission rates shown are the average of two test runs (samples).

3. FLARE DESCRIPTION AND OPERATION

3.1 Flare Description

The landfill gas flare consists of an insulated steel cylinder 50 feet high and 96 inches inside diameter (see Figure 3-1). Operating landfill gas flow rate is limited, by the Permit, to 2083 cubic feet per minute (3,000,000 cf/day). Landfill gas flow rate was continuously monitored and recorded on a strip chart by the facility. Flare operating temperature during the test was set at 1600°F. Flare temperature was continuously monitored by the facility.

Condensate flow rate is limited to five gallons per minute. The source test was conducted at a condensate flow rate of approximately 2.2 gallons per minute.

3.2 Sample Location

Flare exhaust samples were obtained from each two ports positioned at right angles, located five feet from the top of the flare and approximately 45 feet above ground level.

Inlet samples were obtained from the 10-inch diameter (ID) landfill gas line supplying the flare at least two diameters downstream and at least one diameter upstream of any flow disturbance.

3.3 Process Operation During Testing

The flare was operating under the following conditions during the source test period:

	<u>Run 1</u>	<u>Run 2</u>
Flare Temperature -	1574 °F	1576 °F
Landfill Gas Flow Rate -	1931 scfm	1930 scfm
Condensate Injection Rate -	2.3 gpm	2.2 gpm

The flow of condensate to the flare was intermittent; such intermittent flow is representative of normal operating conditions. A facility strip chart of these process parameters is provided in Appendix G, Process Data.

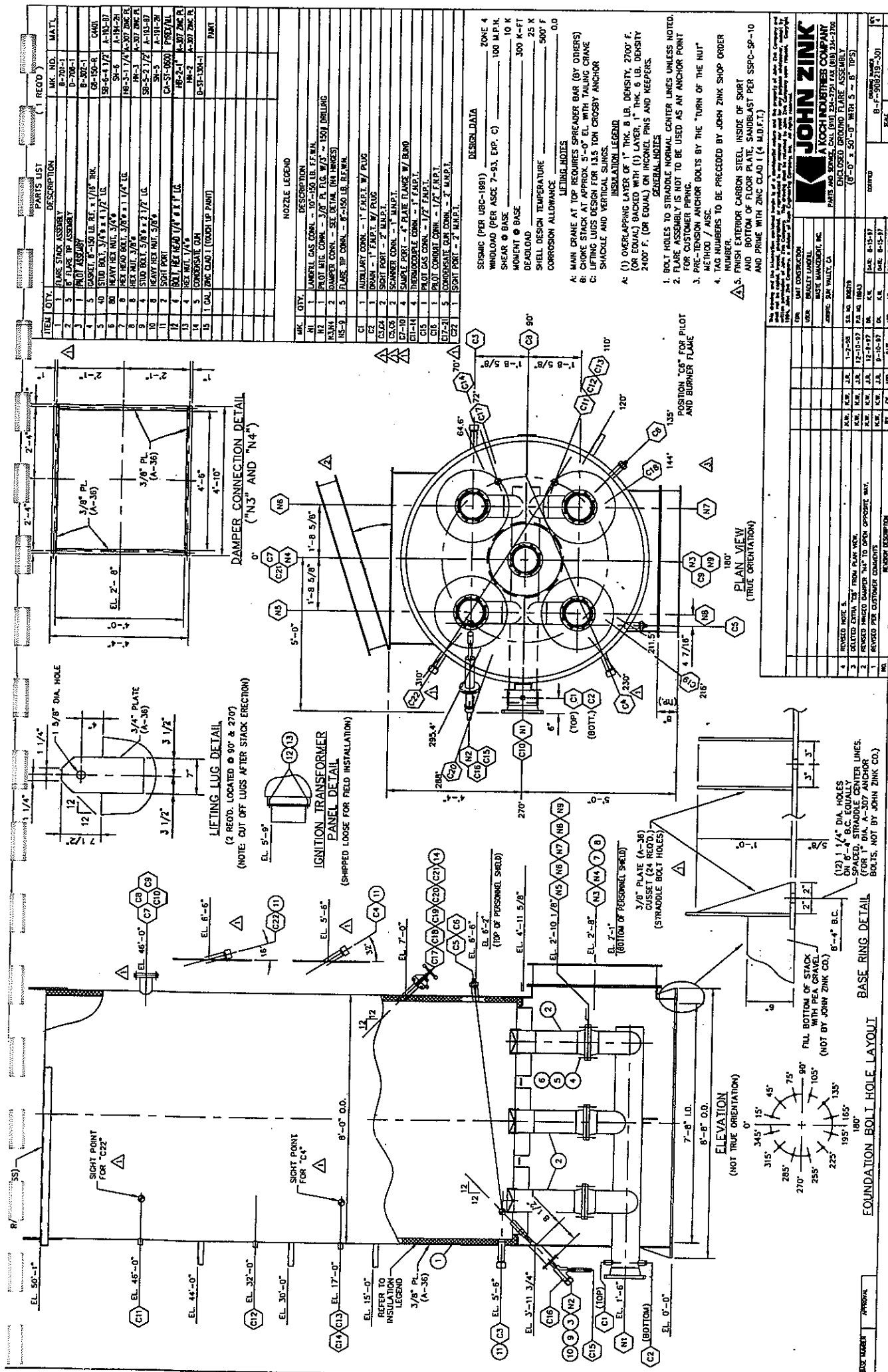


Figure 3-1

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4. SAMPLING/ANALYSES

The sampling/analytical program had been designed to quantify the parameters of interest outlined in Table 1-1.

4.1 Sample Location

4.1.1 Flare Exhaust

At the flare exhaust 24 sample points (12 per diameter), determined in accordance with Method 1, were utilized for the determination of the following compounds:

- Particulate matter
- NO_x
- CO
- O₂/CO₂
- Flow Rate
- Moisture

The exact locations of the sampling points are provided in Appendix D, Field Data Sheets. A description of SCAQMD Method 1 is provided in Appendix A.

One sample points at the center of the stack was utilized for the collection of the following compounds:

- speciated organic compounds
- total non methane hydrocarbons
- methane

4.1.2 Landfill Gas Supply Line

Eight sample points, chosen in accordance with SCAQMD Method 1.1, were used to gather velocity data.

A single sample point was utilized for the collection of the following compounds:

- total non methane hydrocarbons
- methane
- CO
- CO₂/O₂
- reduced sulfur compounds
- speciated organic compounds
- BTU content
- Moisture

4.2 Moisture

4.2.1 Inlet - SCAQMD Method 4.1

Landfill gas moisture content was determined using SCAQMD Method 4.1. Two, one-hour test runs were conducted in conjunction with the outlet particulate and SCAQMD Method 100.1 testing. A description of SCAQMD Method 4.1 is provided in Appendix A.

4.2.2 Outlet - SCAQMD Method 5.1

Moisture content of the flare exhaust was determined using SCAQMD Method 4.1 in conjunction with SCAQMD Method 5.1, as detailed in Appendix A.

4.3 Flow Rate

A copy of the source-dedicated on-line flow chart can be found in Appendix G. This chart identifies: landfill gas flow to flare, condensate flow rate to flare and flare stack temperature readings.

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4.3.1 Inlet

Landfill gas flow rate was determined in accordance with SCAQMD Method 2.3. A description of SCAQMD Method 2.3 is provided in Appendix A.

4.3.2 Outlet - SCAQMD Method 5.1

The landfill flare flow rate was monitored in conjunction with SCAQMD Method 5.1, as detailed in Appendix A. However, since the flare exhaust velocity was below the applicable limit (0.05 in. WG ΔP) of SCAQMD Method 2.1/5.1, the exhaust flow rate was calculated stoichiometrically based upon the landfill gas composition and stack dilution.

4.4 Particulate Matter (Outlet) - SCAQMD Method 5.1

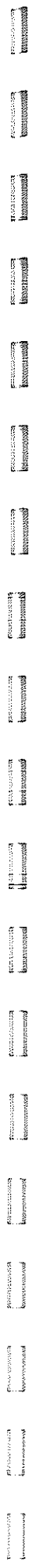
Horizon conducted two, 60-minute test runs on the flare exhaust for particulate matter determination in accordance with SCAQMD Method 5.1 protocol. Twenty-four traverse points were utilized for the collection of particulate matter at the flare exhaust. A description of SCAQMD Method 5.1 is provided in Appendix A. Stack gases were withdrawn through an integral quartz nozzle and probe.

4.5 Oxides of Nitrogen, Carbon Monoxide, Carbon Dioxide, Oxygen (Continuous Emissions Monitoring) - SCAQMD Method 100.1

Two, 60-minute test runs were conducted at the flare exhaust. Twenty-four sample points were utilized. All sampling was performed under the guidelines of SCAQMD Method 100.1 as detailed in Appendix A.

4.6 Hydrogen Sulfide (H₂S), and C₁ - C₃ Sulfur Compounds (Inlet) - SCAQMD Method 307.91 Equivalent

Hydrogen sulfide and C₁ - C₃ sulfur compound samples were collected at the inlet of the



flare using the Tedlar bag collection system depicted in SCAQMD Method 25.2 (Appendix A). All system components coming in contact with the landfill gas were Teflon.

Hydrogen sulfide and C₁ - C₃ sulfur compounds were analyzed using a Method 307.91 equivalent by AtmAA, Inc. Equivalency had been formally granted by SCAQMD to AtmAA, Inc. for this Method.

4.7 Speciated Organic Compounds - SCAQMD Rule 1150.1 List

4.7.1 Inlet

Speciated organic compounds were collected at the flare inlet of the landfill gas using the Tedlar bag collection system depicted in SCAQMD Method 25.2 (Appendix A). All system components coming in contact with the landfill gas were Teflon or stainless steel. Speciated organic compounds (SCAQMD Rule 1150.1 list) were identified and quantified using GC/MS analytical procedures.

4.7.2 Outlet

Speciated organic compound samples were collected in conjunction with the particulate/CEM testing at the exhaust using the Tedlar bag sampling system depicted in Appendix A. Each sample was then analyzed for speciated organic compounds (SCAQMD Rule 1150.1 list) using GC/MS procedures.

4.8 Total Non Methane Hydrocarbons, Methane, Carbon Dioxide and Carbon Monoxide

4.8.1 Inlet - SCAQMD Method 25.1

Total non methane hydrocarbons, methane, CO₂ and CO concentration were determined at the flare inlet from duplicate samples using SCAQMD Method 25.1. A description of SCAQMD Method 25.1 is provided in Appendix A.

4.8.2 Outlet - SCAQMD Method 25.3

Duplicate samples were obtained for total non methane hydrocarbon and methane concentration determination. Total non methane hydrocarbons and methane were determined using SCAQMD Method 25.3. A description of SCAQMD Method 25.3 is provided in Appendix A.

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5. RESULTS DISCUSSION

Detailed results of the testing conducted on Flare #3 on April 21, 2004 are presented in Table 5-1 and 5-2. Since the flare exhaust velocity was below the applicable range ($> 0.05 \Delta P$ inches water gauge) of SCAQMD Method 2.1, the flare exhaust flow rate for each test run was calculated stoichiometrically based upon the composition of the landfill gas and the exhaust stack dilution. Oxide of sulfur emission rate was calculated based upon the landfill gas total sulfur compound concentration and flow rate (see Appendix B).

No sampling or analytical problems or Method deviations were encountered during any phase of the test program.

Table 5-1
Summary of Results
Waste Management - Bradley Landfill
Flare #3
April 21, 2004

	LANDFILL GAS			FLARE EXHAUST		
Run Number	1	2	Avg.	1	2	Avg.
STACK GAS CHARACTERISTICS						
Temperature, degrees F	154	158	156	1587	1577	1582
Moisture, %	5.7	5.6	5.6	12.2	11.7	11.9
Flow Rate, acfm	2078	2057	2067			
Flow Rate, dscfm	1649	1623	1636	10781	* 10197	* 10489 *
Fixed Gases						
Oxygen, %	4.85	-	4.85	10.67	10.26	10.46
Carbon Dioxide, %	26.45	-	26.45	8.92	9.40	9.16
Methane, %	29.10	-	29.10	0.00	0.00	0.00
BTU Value, Btu/scf	294	-	294	-	-	-
EMISSIONS						
Oxides of Nitrogen						
ppm	-	-	-	14.8	14.2	14.5
ppm @ 3 % O2	-	-	-	25.9	24.0	25.0
lb/hr	-	-	-	1.162	1.056	1.109
lb/MMBtu	-	-	-	0.040	0.037	0.038
Carbon Monoxide						
ppm	-	-	-	< 20	< 20	< 20
ppm @ 3 % O2	-	-	-	< 35	< 34	< 34
lb/hr	-	-	-	< 0.95	< 0.90	< 0.93
lb/MMBtu	-	-	-	< 0.033	< 0.032	< 0.032
Total Particulate Matter						
gr/dscf	-	-	-	0.0019	0.0024	0.0021
lb/hr	-	-	-	0.17	0.21	0.19
Total Non-Methane Hydrocarbons (Reactive Organic Compounds)						
ppm, as Methane	12019	-	12019	6.10	-	6.10
lb/hr, as Methane	49.70	-	49.70	0.162	-	0.162
Sulfur Compounds						
Hydrogen Sulfide, ppm	21.2	-	21.2	0.50	-	0.50
Total Sulfur, ppm as H2S	29.3	-	29.3	-	-	-
Oxides of Sulfur**						
lb/hr	-	-	-	0.49	-	0.49

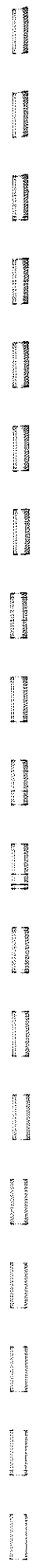
* Flow Rate calculated stoichiometrically

** Calculated from sulfur balance

Table 5-2
Trace Organic Species
Destruction Efficiency Results
Waste Management - Bradley Landfill
Flare #1
April 21, 2004

Species	Inlet		Outlet		Destruction Efficiency (%)
	Concentration (ppb)	Emission Rate (lb/hr)	Concentration (ppb)	Emission Rate (lb/hr)	
Hydrogen Sulfide	212000	1.87E+00	< 500	< 2.83E-02	> 98.49
Benzene	5000	1.01E-01	< 0.2	< 2.59E-05	> 99.97
Benzylchloride	< 40	< 1.31E-03	< 0.8	< 1.68E-04	NA
Chlorobenzene	256	7.48E-03	< 0.2	< 3.75E-05	> 99.50
Dichlorobenzenes	1950	7.41E-02	< 1.1	< 2.68E-04	> 99.64
1,1-dichloroethane	144	3.69E-03	< 0.2	< 3.28E-05	> 99.11
1,2-dichloroethane	40.1	1.03E-03	< 0.2	< 3.28E-05	> 96.80
1,1-dichloroethylene	44.6	1.12E-03	< 0.2	< 3.22E-05	> 97.12
Dichloromethane	344	7.56E-03	0.26	3.66E-05	99.52
1,2-dibromoethane	< 30	< 1.46E-03	< 0.2	< 6.23E-05	NA
Perchloroethene	1360	8.34E-02	< 0.1	< 3.93E-05	> 99.95
Carbon tetrachloride	< 30	< 1.19E-03	< 0.1	< 2.55E-05	NA
Toluene	27400	6.52E-01	0.69	1.05E-04	99.98
1,1,1-trichloroethane	< 20	< 6.88E-04	< 0.1	< 2.21E-05	NA
Trichloroethene	482	1.63E-02	< 0.1	< 2.17E-05	> 99.87
Chloroform	< 20	< 6.16E-04	< 0.1	< 1.97E-05	NA
Vinyl Chloride	392	3.23E-04	< 0.2	< 2.07E-05	> NA
m xylenes	20400	5.59E-01	0.48	8.44E-05	99.98
o+p xylene	3000	8.22E-02	< 0.2	< 3.52E-05	> 99.96
TNMHC	12019325	4.97E+01	6100	1.62E-01	99.67

Note: All values preceded by "<" are below the detection limit - reported values are detection limit values.
 NA--Not applicable: Destruction efficiency cannot be calculated since both inlet and outlet values are below the detection limit.



APPENDIX A - Sampling and Analytical Methods

Method:	Stack Gas Velocity and Volumetric Flow Rate From Small Stacks or Ducts
Applicable for Methods:	SCAQMD Method 2.3
Principle:	The average gas velocity in a stack gas is determined from the gas density and from measurement of the average velocity head with a standard pitot tube.
Sampling Procedure:	The velocity head and temperature is measured at the traverse points specified by SCAQMD Method 1.2. The static pressure in the stack and the atmospheric pressure is determined. The stack gas molecular weight is determined from independent measurements of O ₂ , CO ₂ and H ₂ O concentrations.
Sample Recovery: and Analyses:	The stack gas velocity is determined from the measured average velocity head, the measured dry concentrations of O ₂ and CO ₂ and the measured concentration of H ₂ O. The velocity is determined from the following set of equations:

Where,

ΔP = velocity head, inches in H₂O
 T_s = gas/temperature, degrees R
 P_s = absolute static pressure

M_{wd} = dry molecular weight
 M_w = molecular weight
 C_p = pitot flow coefficient

Dry molecular weight of stack gas

$$M_{wd} = 0.44 (\%CO_2) + 0.32 (\%O_2) + 0.28 (\%N_2 + \%CO)$$

Molecular weight of stack gas, wet basis

$$M_w = (M_{wd} \times M_d) + 18 (1 - M_d)$$

$$\text{Where, } M_d = \frac{100 - Bws}{100}$$

Stack gas velocity

$$(V_s)_{avg.} = (5130) C_p \times \sqrt{\Delta P_{avg.}} \times \sqrt{T_s} \times \left(\frac{1}{P_s \times M_w} \right)^{1/2}$$

Method:

Determination of Moisture in Stack Gases

Applicable for
Methods:

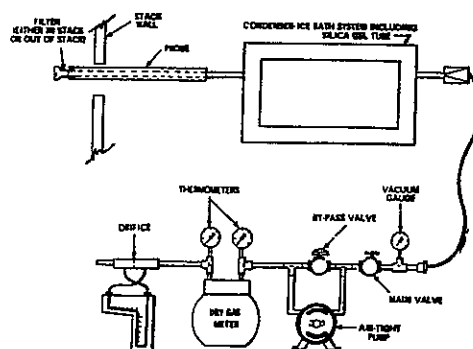
EPA Method 4, ARB 1-4, SCAQMD Method 4.1

Principle:

A gas sample is extracted at a constant rate from the source; moisture is removed from the stream and determined either volumetrically or gravimetrically.

Sampling Procedure:

Set up train as shown in the following figure. Sample is drawn at a constant rate through a sufficiently heated probe. The probe is connected to the impinger train by Teflon or glass tubing. The train consists of two greenburg smith impinger (SCAQMD 4.1) or one modified and 1 greenburg smith impinger (CARB & EPA) each containing 100 ml of water, an empty impinger as a knock-out and an impinger containing silica gel to protect the pump from moisture.



Sample Recovery:
and Analyses:

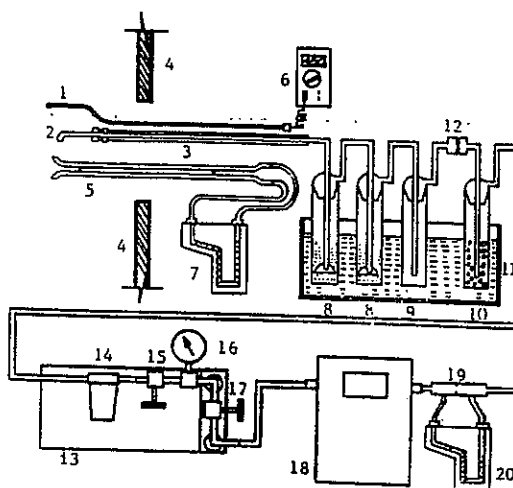
Following testing, moisture content is determined gravimetrically or volumetrically from initial and final impinger contents weights or volume.

Method: **Determination of Particulate Matter Emissions From Stationary Sources Using a Wet Impingement Train**

Reference: SCAQMD Method 5.1

Principle: Stack gas is withdrawn isokinetically from the source through a sample train. Particulate matter is collected in impingers containing deionized water and on a back-up filter. The impingers are contained in an ice bath to maintain a sampled gas temperature of approximately 15° C (60° F). The filter is not heated.

Sampling Procedure: The sampling train is shown in the figure below. The sample is drawn isokinetically through a glass or quartz probe (hi-temp). The probe is connected to an impinger train by Teflon tubing. The train consists of two Greenburg-Smith impingers which contain 100 ml of DI water; an empty impinger as a knock-out; and an impinger containing silica gel to protect the pump from moisture. Sample is withdrawn isokinetically from each predetermined sample point (determined using SCAQMD Method 1.1) through the sample train, which is followed by a vacuum line, a pump, a dry gas meter and a calibrated orifice.



- | | |
|--|---|
| 1. Temperature Sensor | 11. Ice Bath |
| 2. Nozzle | 12. Filter |
| 3. Glass Lined Stainless Steel Probe | 13. Sealed Pump (Leak Free) |
| 4. S-type Pitot Tube | 14. Filter for Pump |
| 5. Stack Wall | 15. Metering Valve |
| 6. Temperature Sensor Meter | 16. Vacuum Gauge |
| 7. Pitot Tube Inclined Manometer | 17. By-pass Valve |
| 8. Impinger with 100 ml H ₂ O | 18. Temperature Compensated Dry Gas Meter |
| 9. Empty Bubbler | 19. Orifice |
| 10. Bubbler with Silica Gel | |

Sample Recovery: The moisture content is determined either gravimetrically or volumetrically from initial and final impinger weights or volume. Then the filter, probe/impinger rinse (including nozzle rinse, liner rinse, impinger contents and rinses) and silica gel are recovered into Containers #1, #2 and #3, respectively.

Analytical Procedure: The aqueous sample is filtered through a tared fiberglass filter. An organic extraction is performed on the resulting solution using methylene chloride. Both the extraction filter and sample train filter are desiccated then measured gravimetrically. The organic extract and aqueous catch are evaporated, desiccated and measured gravimetrically.

If significant levels of sulfur compounds are present in the stack, each sample fraction is analyzed by acid-base titration for acid sulfate content and by barium-thorin titration for sulfate content.

Method:

Carbon Monoxide by SCAQMD Micro Total Carbon Analyses

Reference:

SCAQMD Method 10.1 (Tedlar Bag)

Principle:

A Tedlar bag is filled with flue gas at a constant rate. The bag contents are analyzed by total combustion analyses/flame ionization detection for carbon monoxide.

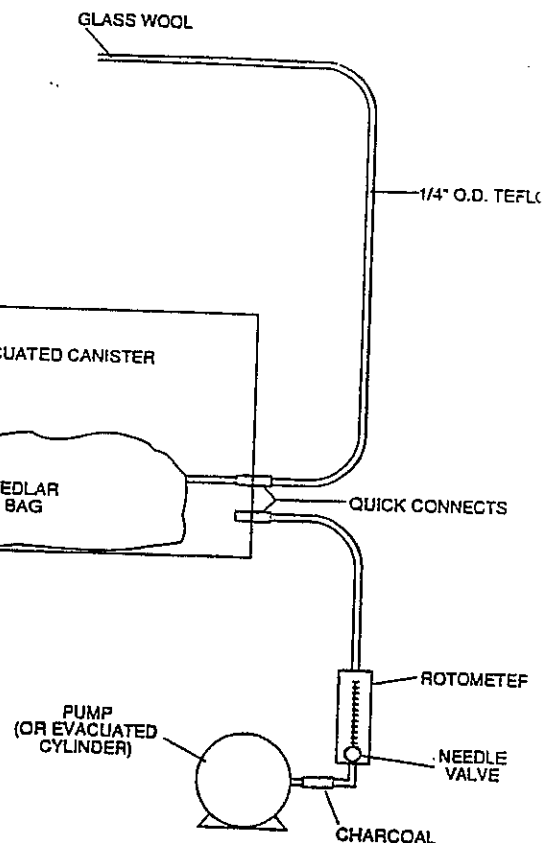
Sampling Procedure:

A gas sample is collected by evacuating the canister, see figure, at a constant rate over each test run using a rotameter/needle valve and a diaphragm pump. This causes the Tedlar bag to fill with stack gas at a constant rate while maintaining sample integrity.

Prior to each sampling run, the evacuated canister (containing the Tedlar bag) is leak checked at 2" Hg vacuum. The sample train upstream of the Tedlar bag is then purged with stack gas. At the conclusion of each test run, each Tedlar bag sample is sealed and stored in an opaque container pending analysis.

Analytical Procedure:

Carbon monoxide concentration from the sample is determined using the SCAQMD Total Combustion Analysis (TCA) procedure.



Method:	Determination of Total Gaseous Non-Methane Organic Emissions as Carbon
Reference:	SCAQMD Method 25.1
Principle:	A sample of flue gas is drawn through a condensate trap and into an evacuated 12 liter tank. Volatile organic compounds (VOC), as total gaseous non-methane organics (TGNMO), are determined by combining results from independent analysis of condensate in the traps and gases in the tanks.
Sampling Procedure:	<p>Duplicate gas samples are withdrawn from a source at a constant rate through condensate traps immersed in dry ice followed by evacuated 12 liter (nominal) tanks. Heavy organic components condense as liquids and solids in the condensate traps. Lighter components pass as gases through the traps into the tanks. The combined results from tanks and trap analyses are used to determine a qualitative and quantitative expression of the effluent gas stream. Duplicate sampling is designed into the system to demonstrate precision.</p> <p>The sampling apparatus is checked for leaks prior to the sampling program by attaching the probe end to an absolute pressure gauge and vacuum pump in series. The sample lines were evacuated to less than 10 mm Hg and the gauge shutoff valve is then closed. The sample lines are deemed to be leak-free if no loss of vacuum occurs as indicated by the vacuum gauge. During sampling the tank pressures are monitored with a 0-30 inch vacuum gauge to ensure integrated sampling.</p> <p>The final vacuum of each sample is measured using a slack tube manometer. The sample is then pressurized to 800 mm Hg absolute with ultrapure nitrogen. Each sample is then analyzed using the SCAQMD TCA procedure for total non methane hydrocarbons.</p>
Analytical Procedure:	<p>Condensate traps are analyzed by first stripping carbon dioxide (CO₂) from the trap. The organic contents are then removed and oxidized to CO₂. This CO₂ is quantitatively collected in an evacuated vessel and measured by injection into a flame ionization detection/total combustion analysis (FID/TCA) system.</p> <p>The organic content of the sample fraction collected in each tank is measured by injecting a portion into the FID/TCA analysis system which uses a two phase gas chromatography (GC) column to separate carbon monoxide (CO), methane (CH₄) and carbon dioxide (CO₂) from each other and from the total gaseous non-methane organics (TGNMO) which are eluted as backflush. All eluted components are first oxidized to CO₂ by a hopcalite catalyst and then reduced to methane by a nickel catalyst. The resulting methane is detected using the flame ionization detector. A gas standard containing CO, CH₄, CO₂ and propane, traceable to NBS, is used to calibrated the FID/TCA analysis system.</p>

Method:

Determination of Total Gaseous Non-Methane Organic Emissions as Carbon

Reference:

SCAQMD Method 25.3

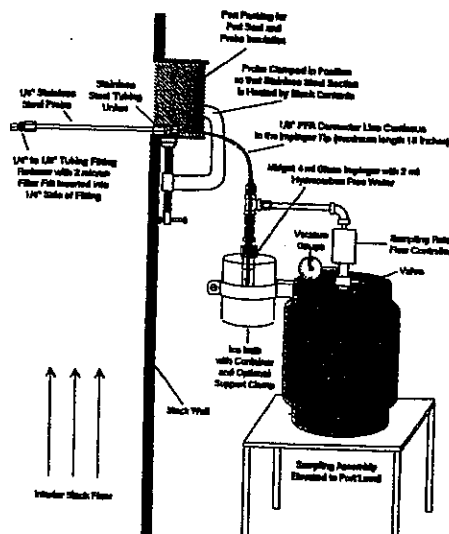
Principle:

A sample of flue gas is drawn through a condensate trap (mini-impinger) and into an evacuated six liter SUMMA canister. Volatile organic compounds (VOC), as total gaseous non-methane organics (TGNMO), are determined by combining results from independent analysis of condensate in the traps and gases in the SUMMA canisters.

Sampling Procedure:

Duplicate gas samples are withdrawn from a source at a constant rate through condensate traps immersed in an ice bath followed by evacuated six liter (nominal) SUMMA canisters. Heavy organic components condense as liquids and solids in the condensate traps. Lighter components pass as gases through the traps into the canisters. The combined results from canisters and mini-impinger analyses are used to determine a qualitative and quantitative expression of the effluent gas stream. Duplicate sampling is designed into the system to demonstrate precision.

The sampling apparatus is checked for leaks prior to the sampling program by capping the end of the sample probe. The sample flow valve is then opened and then closed to introduce vacuum to the system. The vacuum drop should then cease numerically above 10 in. Hg. A cease in movement of the vacuum gauge for a period of ten minutes indicates an acceptable leak check. When sampling is initiated, the vacuum gauge must indicate a canister vacuum of greater than 28 in. Hg. Immediately after sampling a post-test leak check is performed, followed by a rinse of the PFA line into the condensate trap with 0.5 to 1.0 ml of hydrocarbon free water.



Analytical Procedure:

Condensate traps are analyzed for total organic carbon by liquid injection into an infrared total organic carbon analyzer.

The organic content of the sample fraction collected in each canister is measured by injecting a portion into the FID/TCA analysis system which uses a two phase gas chromatography (GC) column to separate carbon monoxide (CO), methane (CH₄) and carbon dioxide (CO₂) from each other and from the total gaseous non-methane organics (TGNMO) which are eluted as backflush. All eluted components are first oxidized to CO₂ by a hopcalite catalyst and then reduced to methane by a nickel catalyst. The resulting methane is detected using the flame ionization detector. A gas standard containing CO, CH₄, CO₂ and propane, traceable to NBS, is used to calibrate the FID/TCA analysis system.

CONTINUOUS EMISSIONS MONITORING SYSTEM - TRUCK

SCAQMD Method 100.1

The continuous emissions monitoring system consists of a Thermo Electron Model 10AR chemiluminescence NO/NO_x analyzer, a Teledyne electro chemical O₂ analyzer, a Thermo Electron Model 48H CO gas filter correlation analyzer and a Horiba PIR 2000 non dispersive infrared CO₂ analyzer. All analyzer specifications are provided in Table 1. All concentrations are determined on a dry basis. Concentrations of NO_x, CO, O₂ and CO₂ are continuously recorded on a Linseis 10-inch strip chart recorder and a Strawberry Tree Data Acquisition System (DAS). The extractive monitoring system conforms with the requirements of SCAQMD Method 100.1.

The sampling probe (heated to 250°F), constructed of 1/2 inch-diameter 316 stainless steel, is connected to a condenser with a six foot length of 3/8 inch Teflon line (heated to 250°F). A Nupro stainless steel filter (10 micron) is connected at the tip of the probe and maintained at stack temperature.

The condenser consists of a series of two stainless steel moisture knock-out bottles immersed in an ice water bath. The system is designed to minimize contact between the sample and the condensate. Condensate is continuously removed from the knock-out bottles via a peristaltic pump. The condenser outlet temperature is monitored either manually at 10-minute intervals or on a strip chart recorder/DAS system. The sample exiting the condenser is then transported through a filter, housed in a stainless steel holder, followed by 3/8 inch O.D. Teflon tubing and a Teflon coated (or stainless steel/viton) diaphragm pump to the sample manifold. The sample manifold is constructed of stainless steel tubing and directs the sample through each of five rotameters to the NO_x monitor, O₂ monitor, CO monitor, CO₂ monitor and excess sample exhaust line, respectively. Sample flow through each channel is controlled by a back pressure regulator and by stainless steel needle valves on each rotameter. All components of the sampling system that contact the sample are composed of stainless steel, Teflon or glass.

The calibration system is comprised of two parts: the analyzer calibration and the system bias check. The calibration gases are, at a minimum, certified to $\pm 1\%$ by the manufacturer. Where necessary to comply with the reference method requirements, EPA Protocol 1 gases are used. The cylinders are equipped with pressure regulators which supply the calibration gas to the analyzers at the same pressure and flow rate as the sample. The selection of zero, span or sample gas directed to each analyzer is accomplished by operation of the zero, calibration or sample selector knobs located on the main flow control panel.

For SCAQMD Method 100.1 testing, the following procedures are conducted before and after each series of test runs:

Leak Check:

The leak check is performed by plugging the end of the sampling probe, evacuating the system to at least 20 inches of Hg. The leak check is deemed satisfactory if the system holds 20 inches of Hg vacuum for five minutes with less than one inch Hg loss.

Linearity Check:

The NO_x, CO, CO₂ and O₂ analyzers linearity check is performed by introducing, at a minimum, zero gas, mid range calibration gas (40-60% scale) and high range calibration gas (80-100% scale). Instrument span value is set on each instrument with the mid range gas. The high range calibration gas (80-100% scale) is then introduced into each instrument without any calibration adjustments. Linearity is confirmed, if all values agree with the calibration gas value to within 2% of the range.

Stratification Check:

A stack stratification check is performed (pre-test only) by traversing the stack with the appropriate number of traverse alternately with the reference point (center). If the gas composition is homogenous, < 10% variation between any traverse points in the gas stream and the normalized average point, single point gas sampling is performed at the reference point. If stratification exceeds the 10% criteria, then the stack cross section is traversed during sampling.

System Bias Check:

The system bias check is accomplished by transporting the same gases used to zero and span the analyzers to the sample system as close as practical to the probe inlet. This is accomplished by opening a valve located on the probe, allowing the gas to flow to the probe and back through the moisture knockout and sample line to the analyzers. During this check the system is operated at the normal sampling rate with no adjustments. The system bias check is considered valid if the difference between the gas concentration exhibited by the measurement system which a known concentration gas is introduced at the sampling probe tip and when the sample gas is introduced directly to the analyzer, does not exceed $\pm 5\%$ of the analyzer range.

Response Time:

Response time (upscale and downscale) for each analyzer is recorded during the system bias check. Upscale response time is defined as the time it takes the subject analyzer gas to reach 95% of the calibration gas value after introducing the upscale gas to the sample bias calibration system. Downscale response time is defined as the time it takes the subject analyzer to return to zero after the zero gas is introduced into the sample system bias calibration system.

NO_x Conversion Efficiency

The NO_x analyzer NO₂ conversion efficiency is determined by injecting a NO₂ gas standard directly into the NO_x analyzer (after initial calibration). The analyzer response must be a least 90% of the NO₂ standard gas value.

NO₂ Converter Efficiency (alternate method)

The mid level NO gas standard is directly injected into a clean leak-free Tedlar bag. The bag is then diluted 1:1 with air (20.9 % O₂). The bag is immediately attached to the NO_x sample line. The initial NO_x concentration is recorded on the strip chart. After at least 30 minutes the Tedlar bag is reattached to the NO_x sample line. Analyzer response must be at 98% of the initial Tedlar bag NO_x value to be acceptable.

In between each sampling run the following procedures are conducted:

Zero and Calibration Drift Check:

Upon the completion of each test run, the zero and calibration drift check is performed by introducing zero and mid range calibration gases to the instruments, with no adjustments (with the exception of flow to instruments) after each test run. The analyzer response must be within $\pm 3\%$ of the actual calibration gas value.

Analyzer Calibration:

Upon completion of the drift test, the analyzer calibration is performed by introducing the zero and mid range gases to each analyzer prior to the upcoming test run and adjusting the instrument calibration as necessary.

System Bias Check

(same as above)

A schematic of the sample system and specific information of the analytical equipment is provided in the following pages.

TABLE 1

CONTINUOUS EMISSIONS MONITORING LABORATORY - TRUCK

NO_x CHEMILUMINESCENT ANALYZER -- THERMO ELECTRON MODEL 10 A

Response Time (0-90%)	1.5 sec -- NO mode/1.7 sec -- NO _x mode
Zero Drift	Negligible after 1/2 hour warmup
Linearity	$\pm 1\%$ of full scale
Accuracy	Derived from the NO or NO ₂ calibration gas, $\pm 1\%$ of full scale
Operating Ranges (ppm)	2.5, 10, 25, 100, 250, 1000, 2500, 10000
Output	0-1 volt

O₂ ANALYZER, FUEL TYPE -- TELEDYNE MODEL 326RA

Response Time (0-90%)	60 seconds
Accuracy	$\pm 1\%$ of scale at constant temperature $\pm 1\%$ of scale of $\pm 5\%$ of reading, whichever is greater, over the operation temperature range.
Operating Ranges (%)	0-5, 0-25
Output	0-1 volt

O₂ ANALYZER, PARAMAGNETIC -- SERVOMEX MODEL 1400B

Response Time (0-90%)	15 seconds
Accuracy	0.1% oxygen
Linearity	$\pm 1\%$ scale
Operating Ranges (%)	0-25, 0-100
Output	0-1 volt

CO GAS FILTER CORRELATION -- THERMO ELECTRON MODEL 48H

Response Time (0-95%)	1 minute
Zero Drift	± 0.2 ppm CO
Span Drift	Less than 1% full scale in 24 hours
Linearity	$\pm 1\%$ full scale, all ranges
Accuracy	± 0.1 ppm CO
Operating Ranges (ppm)	50, 100, 250, 500, 1000, 2500, 5000, 10,000, 25,000, 50,000
Output	0-1 volt

TABLE 1 (Cont.)

CO₂ INFRARED GAS ANALYZER -- HORIBA - MODEL PIR 2000

Response Time (0-90%)	5 seconds
Zero Drift	$\pm 1\%$ of full scale in 24 hours
Span Drift	$\pm 1\%$ of full scale in 24 hours
Linearity	$\pm 2\%$ of full scale
Resolution	Less than 1% of full scale
Operating Ranges (%)	0-5, 0-15, 0-25
Output	0-1 volt

SO₂ PULSED FLOURESCENT - TECO - MODEL 43C-HL

Response Time	80 seconds
Zero Drift	$\pm 1\%$
Span Drift	$\pm 1\%$
Linearity	$\pm 1\%$
Resolution	$\pm 1\%$
Operating Ranges	5, 10, 20, 50, 100, 200, 500, 1000, 2000, 5000
Output	0-10 volt

RATFISCH FID TOTAL HYDROCARBON ANALYZER -- MODEL 55CA

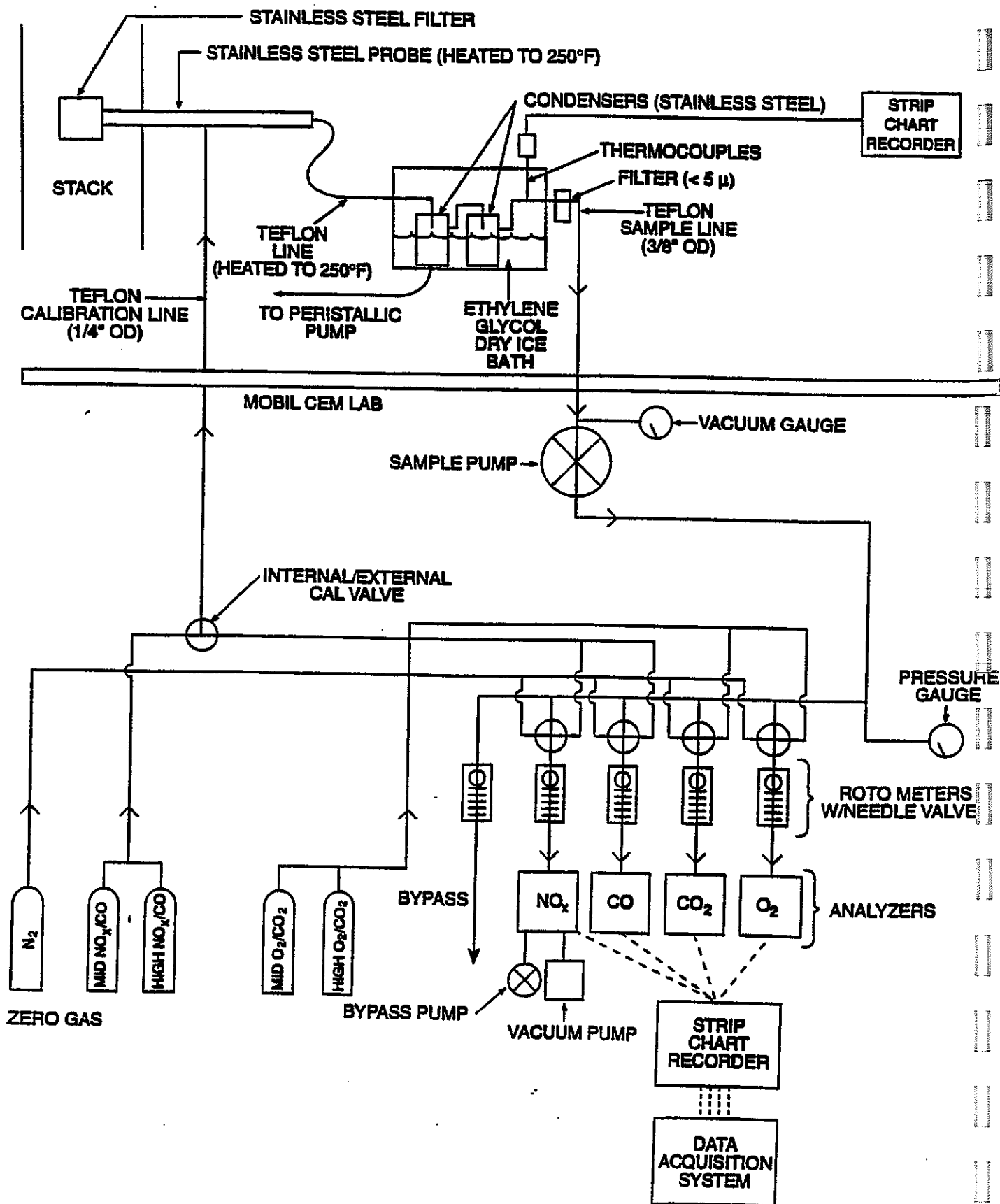
Response Time (0-90%)	5 seconds
Zero Drift	$\pm 1\%$ full scale in 24 hours
Span Drift	$\pm 1\%$ full scale in 24 hours
Linearity	$\pm 1\%$ full scale - constant
Accuracy	$\pm 1\%$ full scale at constant temp.
Operating Ranges (ppm)	10, 100, 1000, 10,000
Output	0 - 10 volts

LINSEIS MODEL L2045 FOUR PEN STRIP CHART RECORDER

Pen Speed	up to 120 cm/min
Measuring Response	0-20 volts
Linearity Error	0.25%
Accuracy	0.3%
Zero Suppression	Manual (from 1 to 10X full scale)

LINEAR 3 PEN CONTINUOUS -- MODEL 595 STRIP CHART

Pen Response	20 inches/second
Measuring Response	1 Mv through 5V
Zero Set	Electronically adjustable full scale with 1 full scale of zero suppression
Accuracy	Total limit of error $\pm 0.5\%$



Method:	NO/NO_x by Continuous Analyzer
Applicable Reference Methods:	EPA 7E, EPA 20; CARB 100, BAAQMD ST-13A, SCAQMD 100.1
Principle:	A sample is continuously withdrawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of NO or NO _x .
Analyzer:	TECO Model 10AR
Measurement Principle:	Chemiluminescence
Accuracy:	1 % of full scale
Ranges:	0-2.5, 0-10, 0-25, 0-100, 0-250, 0-1000, 0-2500, 0-10,000 ppm
Output:	0-10 V
Inferences:	Compounds containing nitrogen (other than ammonia) may cause interference.
Response Time:	90%, 1.5 seconds (NO mode) and 1.7 seconds (NO _x mode)
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. If EPA Method 20 is used, that method's specific procedures for selecting sample points are used.
Analytical Procedure:	<p>The oxides of nitrogen monitoring instrument is a chemiluminescent nitric oxide analyzer. the operational basis of the instrument is the chemiluminescent reaction of NO and ozone (O₃) to form NO₂ in an excited state. Light emission results chemiluminescence is monitored through an optical filter by a high sensitivity photomultiplier tube, the output of which is electronically processed so it is linearly proportional to the NO concentration. The output of the instrument is in ppmV.</p> <p>When NO₂ is expected to be present in the flue gas, a supercooled water dropout flask will be placed in the sample line to avoid loss of NO₂. Since NO₂ is highly soluble in water, "freezing out" the water will allow the NO₂ to reach the analyzers for analysis. The analyzer measures NO only. In the NO_x mode, the gas is passed through a moly converter which converts NO₂ to NO and a total NO_x measurement is obtained. NO₂ is determined as the difference between NO and NO_x. Use of a moly converter instead of a stainless steel converter eliminates NH₃ interference; NH₃ is converted to NO with a stainless converter, but not with a moly converter.</p>

Method:	Oxygen (O₂) by Continuous Analyzer
Applicable Reference Methods:	EPA 3A, EPA 20, CARB 100, BAAQMD ST-14, SCAQMD 100.1
Principle:	A sample is continuously withdrawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of O ₂ concentration.
Analyzer:	Teledyne Model 326R
Measurement Principle:	Electrochemical cell
Ranges:	0-5, 0-25 % 0-100 %
Accuracy:	1 % of full scale
Output:	0-1 V
Interferences:	Halogens and halogenated compounds will cause a positive interference. Acid gases will consume the fuel cell and cause a slow calibration drift.
Response Time:	90% < 60 seconds
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. If Method 20 is used, that method's specific procedures for selecting sample points are used. Otherwise, stratification checks are performed at the start of a test program to select single or multiple-point sample locations.
Analytical Procedure:	An electrochemical cell is used to measure O ₂ concentration. Oxygen in the flue gas diffuses through a Teflon membrane and is reduced on the surface of the cathode. A corresponding oxidation occurs at the anode internally and an electric current is produced that is proportional to the concentration of oxygen. This current is measured and conditioned by the instrument's electronic circuitry to give an output in percent O ₂ by volume.

Method:	Carbon Dioxide (CO₂) by Continuous Analyzer
Applicable Reference	EPA 3A, CARB 100, BAAQMD ST-5, SCAQMD 100.1
Principle:	A sample is continuously drawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of CO ₂ concentration.
Analyzer:	PIR 2000
Measurement Principle:	Non-dispersive infrared (NDIR)
Accuracy:	1 % of full scale
Ranges:	0-5, 0-15 %
Output:	0-1 V
Interferences:	A possible interference includes water. Since the instrument receives dried sample gas, this interference is not significant.
Response Time:	5 seconds
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously.
Analytical Procedure:	Carbon dioxide concentrations are measured by short path length non-dispersive infrared analyzers. These instruments measure the differential in infrared energy absorbed from energy beams passed through a reference cell (containing a gas selected to have minimal absorption of infrared energy in the wavelength absorbed by the gas component of interest) and a sample cell through which the sample gas flows continuously. The differential absorption appears as a reading on a scale of 0-100 %.

Method:	Carbon Monoxide (CO) by NDIR/Gas Filter Correlation
Applicable Reference Methods:	EPA 6C; CARB 1-100; BAAQMD ST-6, SCAQMD 100.1
Principle:	A sample is continuously drawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of CO concentration.
Analyzer:	TECO, Model 48H
Measurement Principle:	NDIR/Gas Filter Correlation
Precision:	0.1 % ppm
Ranges: ppm	0-50, 0-100, 0-250, 0-500, 0-1000, 0-2500, 0-5000, 0-10000, 0-2500, 0-3,000
Output:	0-1 V
Interferences:	Negligible interference from water and CO ₂
Rise/Fall times (0-95 %)	1 minute @ 1 lpm flow, 30 second integration time
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. Sample point selection has been described previously.
Analytical Procedure:	Radiation from an infrared source is chopped and then passed through a gas filter which alternates between CO and N ₂ due to rotation of a filter wheel. The radiation then passes through a narrow band-pass filter and a multiple optical pass sample cell where absorption by the sample gas occurs. The IR radiation exits the sample cell and falls on a solid state IR detector.

Method:	Sulfur Dioxide (SO₂) by Pulsed Fluorescent
Applicable Reference Methods:	EPA 10; CARB 1-100; BAAQMD ST-6, SCAQMD 100.1
Principle:	A sample is continuously drawn from the flue gas stream, conditioned and conveyed to the instrument for direct readout of SO ₂ concentration.
Analyzer:	TECO, Model 43C-HL
Measurement Principle:	Pulsed fluorescence SO ₂ analyzer
Precision:	0.1 % ppm
Ranges:	5, 10, 20, 50, 100, 200 ppm
Output:	0-10 V
Interferences:	Less than lower detectable limit except for the following: NO < 3 ppb, m-xylene < 2 ppm, H ₂ O < 2% of reading.
Response Time:	80 seconds
Sampling Procedure:	A representative flue gas sample is collected and conditioned using the CEM system described previously. Sample point selection has been described previously.
Analytical Procedure:	The sample flows into the fluorescent chamber, where pulsating UV light excites the SO ₂ molecules. The condensing lens focuses the pulsating UV light into the mirror assembly. The mirror assembly contains four selecting mirrors that reflect only the wavelengths which excite SO ₂ molecules. As excited SO ₂ molecules decay to lower energy states they emit UV light that is proportional to the SO ₂ concentration. The PMT (photomultiplier tube) detects UV light emission from decaying SO ₂ molecules. The PMT continuously monitors pulsating UV light source and is connected to a circuit that compensates for fluctuating in the light.



AtmAA Inc.

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environmental consultants
laboratory services

**Tandem Gas Chromatographic/Mass Spectroscopic-Electrolytic
Conductivity Detector (GC/MS-ELCD) Method for
Determination of Total Sulfur in Gas Samples**

AtmAA, Inc.
03-060

3/30/93

This method measures selected reduced sulfur species, including but not limited to hydrogen sulfide, carbonyl sulfide, methyl mercaptan, ethyl mercaptan, dimethyl sulfide, carbon disulfide, isopropyl mercaptan, n-propyl mercaptan, and dimethyl disulfide in gaseous sample matrices using gas chromatographic separation and a mass spectrometric and electrolytic conductivity detector (ELCD), where the ELCD measures hydrogen sulfide only. A non-polar methyl silicon capillary gas chromatographic column is used for component separation and selected ion monitoring is used for component quantification. Component quantification is obtained using a multi-component external standard prepared by Scott Specialty Gases. The lower detection limit varies by component but is at least 0.1 ppmv ethyl mercaptan (component of lowest sensitivity) for a 0.31 ml sample volume injection. The upper quantitation limit has not been determined but is at least beyond 80 ppmv dimethyl disulfide, for which response remained linear from 0.1 ppmv to 80 ppmv.

Hydrogen sulfide is measured using an electrolytic conductivity detector operated in the oxidative sulfur mode. A Chromosil 310 column, operated isothermally at 45°C. is used to separate H₂S from other sulfur components. A fixed volume loop injection is used in the analysis for H₂S.

Lower Detection Limits (LDL's):

Using a 1 ml injection volume for H₂S by electrolytic conductivity detector and 0.40 ml injection volume for GC/MS measured sulfur compounds, the following LDL's are obtained:

	(ppmv)
Hydrogen sulfide	0.5
Carbonyl sulfide	0.03
Methyl mercaptan	0.03
Ethyl mercaptan	0.04
Dimethyl sulfide	0.02
Carbon disulfide	0.02
i-propyl mercaptan	0.03
n-propyl mercaptan	0.03
Dimethyl disulfide	0.02

Equipment:

A Hewlett-Packard 5890 series II gas chromatograph (GC), Hewlett-Packard 5971A Mass Selective Detector, 486 MS/DOS computer and HP operating software are used for all sulfur species except H₂S. The GC is fitted with a heated 6-port Valco 1/16" line, sample injection valve. All gas transfer lines to the sample loop are fused silica lined Restek tubing. The fixed volume (0.40 ml) sample loop is Teflon. The transfer line from the valve to the GC column is cleaned and treated blank 0.53 mm OD fused silica line with polyimide coating.

H₂S is measured using a Varian 1400 GC with the Hall oxidative quartz tube furnace and electrolytic cell attached. Nitrogen is used as carrier and oxygen is used as the combustion gas.

Multi-component gaseous standards are prepared by Scott Specialty Gas and are contained in two separate aluminum cylinders and a Scotty IV canister as follows:

Cylinder A (CAL12250)

Carbonyl sulfide 15.2 ppmv
Ethyl mercaptan 13.4 ppmv
Carbon disulfide 16.1 ppmv

Cylinder B (CAL3563)

Hydrogen sulfide 12.3 ppmv
Methyl mercaptan 22.6 ppmv
Dimethyl sulfide 20.3 ppmv
Dimethyl disulfide

Scotty IV (mix 252)

Hydrogen Sulfide 93.8 ppmv

Gas tight clean glass volumetric syringes of 10, 20, & 50 ml capacity, with smooth glass barrel (not sintered glass) are used to make volumetric dilutions of sample or standard.

GC/MS SIM parameters:

	Dwell per ion	start time	Ions
Group 1:	75 msec.	8.0 min.	60
Group 2:	75 msec.	10.0 min.	47,48,64
Group 3:	75 msec.	14.5 min.	47,62,76,78,43,61
Group 4:	75 msec.	19.5 min.	79,94,122,142,156, 128

Components monitored:

Group 1: carbonyl sulfide
Group 2: methyl mercaptan
Group 3: ethyl mercaptan, dimethyl disulfide, carbon disulfide, isopropyl mercaptan, n-propyl mercaptan
Group 4: dimethyl sulfide



Component	Quantitation ion	Confirmation ion
carbonyl sulfide	60	none
methyl mercaptan	47	48
ethyl mercaptan	62	47
dimethyl sulfide	62	47
carbon disulfide	76	78
iso-propyl mercaptan	76	43,47,61
n-propyl mercaptan	76	43,47,61
dimethyl disulfide	94	79

Sulfur dioxide is analyzed by monitoring mass 64 which is included in Group 2 ions.

Calibration:

Gaseous standards can be analyzed prior to or after a set of samples. Response factors are determined from a single point standard calibration. Multi-point calibrations are performed to verify linearity. Consistency of standard response with continuing calibrations is observed to indicate performance of multi-point calibration.

Samples containing components at less than the stated LDL can be analyzed by cryogenically focusing a measured volume of gaseous sample onto a glass bead filled Teflon loop immersed in liquid argon. The sample is thermally transferred upon injection by immersing the sample loop in near boiling temperature water. The LDL obtained by this technique is calculated as:

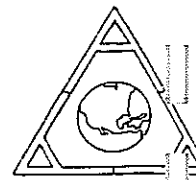
$$LDL_{cryo} = (cryo \text{ volume}/0.40) * LDL_{0.40}$$

Acceptable volumes for cryogenic concentration range from 3 to 100 ml. and are determined based on amounts of other components in the sample such as water, carbon dioxide or hydrocarbons.

Procedure:

A volumetric sample of landfill or source collected gas is transferred from a Tedlar[®] bag to the 6-port valve injection line using a glass syringe of approximately 10 ml. A Teflon loop of 0.40 ml volume is used to inject the sample. When sample concentrations exceed that of the standard, appropriate volumetric sample dilutions are made using the glass syringes with dry nitrogen diluent. Immediately after sample injection, the GC/MS is started. Standards are analyzed in the same manner as samples. Appropriate component peaks are monitored and integrated after sample analysis data set has been obtained.

Hydrogen sulfide is measured using the electrolytic conductivity detector by a separate direct fixed loop valve injection using heated Teflon loop, transfer lines, and Teflon Chromosil 310 GC column.



A response factor for a standard component is calculated as:

$$rf = \text{std. amt.} / \text{std. area}$$

Sample concentration is calculated using the response factor:

$$\text{conc.} = rf \times \text{sample area}$$

At least 10% of samples in a sample set, or minimum of one sample per set are analyzed twice to determine precision. A separate report showing repeat analyses results is included with an analytical report of sulfur component concentrations per each sample set. Repeat analyses must agree within +/- 10% except for component concentrations less than 1 ppmv. A nitrogen blank is analyzed between standards and samples to verify that there is no component carry-over. Samples are analyzed as soon after they are received as possible, preferably same day and within four hours of collection. Data is being gathered to determine stability of sulfur compounds in Tedlar[®] bag containers in an effort to extend sample holding time. Samples are usually analyzed before standards to prevent carry-over, since most sulfur components measured in landfill gas samples are lower in concentration than those in the standards.

GC/MS Analysis Conditions:

GC conditions: a 30 M x 0.2 mm, 0.50 um film methyl silicon PONA column from Hewlett-Packard is temperature programmed as follows:

-65 degrees C, hold min.

15 degrees C min. to 220 degrees C, hold 5 min.

Valve oven Temp. 150 degrees C

GC/MS transfer line 180 degrees C

Carrier gas is helium, pressure regulated at 21 psi.

MS Conditions:

MS calibration is performed periodically prior to performing analyses using PFTBA (perfluoro-tributylamine) as supplied by Hewlett-Packard and as controlled by HP software under the mid-range auto tune program.
Solvent delay = 8 min.

Hall Detector/GC Analysis Conditions:

6' x 1/8" Teflon, Chromosil 310 analytical column

45 degrees C, isothermal

Valve oven & transfer line Temp. 105 degrees C.

Carrier gas is nitrogen, flow rate 18 cc/min.

Oxygen oxidation gas, flow rate 18 cc/min.

Quartz tube oxidation oven Temp. 650 degrees C.



APPENDIX B - Computer Printout of Results

SCAQMD Method 25.1 Analysis

Facility: Bradley Landfill
Source: Flare #3
Job No.: W07-039
Date: 4/21/04

TOTAL COMBUSTION ANALYSIS RESULTS

Sample ID Run Number	Inlet 1A	Inlet 1B	Average
Methane in Tank	291000	291000	291000
TNMHC, Tank (Noncond.)	5210	2130	
TNMHC - Condensables	6040.5	10658.2	
TNMHC - Total	11250.5	12788.2	
CO Concentration (ppm)	221	213	217.0
CO2 Concentration (ppm)	265000	264000	264500
O2 Concentration (%)	4.92	4.78	4.85
Sample Parameters			
Tank Number	O	N	
Trap Number	B	Z	
Sample Tank Volume (l)	12.202	12.051	
Initial Pressure (Torr)	2.5	2.5	
Initial Temperature (deg. K)	292	292	
Final Pressure (mm Hg)	468	486	
Final Temperature (deg. K)	292	292	
Sample Volume (l)	7.50	7.70	
Analysis Pressure (mm Hg)	820	820	
Analysis Temperature (deg. K)	292	292	
ICV Volume (l)	2.266	2.266	
ICV Final Pressure (mm Hg)	800	800	
ICV Final Temperature (deg. K)	292	292	
CO2 in ICV (ppm)	20000	36200	
TNMHC, Trap (Condensables)	6040	10658	
Stack Total TNMHC	11250	12788	12019

NOTE: All hydrocarbon values are in terms of ppm, v/v, as methane.

SCAQMD Methods 1-4 Flowrate Determination

Facility: Bradley Landfill
Source: Flare #3
Job No.: W07-039
Date: 4/21/2004

STANDARD TEMPERATURE	Degrees F	60	60	60
RUN NUMBER	*****	1	2	Average
CLOCK TIME: INITIAL	*****	911	1114	
CLOCK TIME: FINAL	*****	1013	1220	
AVG. STACK TEMPERATURE	Degrees F	154	158	156
AVG. SQUARE DELTA P	Inches H2O	0.9379	0.9255	0.9317
BAROMETRIC PRESSURE	Inches HG	29.07	29.07	29.07
SAMPLING TIME	Minutes	60	60	60
SAMPLE VOLUME	Cubic Feet	45.111	45.007	45.059
AVG. METER TEMP.	Degrees F	75.9	84.5	80.2
AVG. DELTA H	Inches H2O	1.50	1.50	1.50
DGM CALIB. FACTOR [Y]	*****	1.0076	1.0076	1.0076
WATER COLLECTED	Milliliters	55	53	54
CO 2	Percent	26.5	26.5	26.5
O 2	Percent	4.9	4.9	4.9
CO	Percent	0.0	0.0	0.0
CH4	Percent	29.1	29.1	29.1
N 2	Percent	39.6	39.6	39.6
STACK AREA	Square Inches	73.540	73.540	73.5
STATIC PRESSURE	Inches WG	9.00	8.80	8.90
PITOT COEFFICIENT	*****	0.99	0.99	0.99
SAMPLE VOLUME DRY	DSCF	43.01	42.24	42.63
WATER AT STD.	SCF	2.6	2.5	2.5
MOISTURE	Percent	5.7	5.6	5.6
MOLE FRACTION DRY GAS	*****	0.94	0.94	0.94
MOLECULAR WT. DRY	lb/lb Mole	28.93	28.93	28.93
EXCESS AIR	Percent	87	87	87
MOLECULAR WT. WET	lb/lb Mole	28.31	28.32	28.32
STACK GAS PRESSURE	Inches HG	29.73	29.72	29.72
STACK VELOCITY	AFPM	4068	4028	4048
VOLUMETRIC FLOWRATE, DRY STD	DSCFM	1649	1623	1636
VOLUMETRIC FLOWRATE, ACTUAL	ACFM	2078	2057	2067

EMISSION RATES

SAMPLE A				
TNMHC Concentration, as CH4	ppm	11250		11250
TNMHC Concentration, as CH4	mg/dscf	215		215
TNMHC Emission Rate, as CH4	lb/hr	46.9		46.5
SAMPLE B				
TNMHC Concentration, as CH4	ppm	12788		12788
TNMHC Concentration, as CH4	mg/dscf	244		244
TNMHC Emission Rate, as CH4	lb/hr	53.3		52.9
AVERAGE				
TNMHC Concentration, as CH4	ppm	12019		12019
TNMHC Concentration, as CH4	mg/dscf	230		230
TNMHC Emission Rate, as CH4	lb/hr	50.1		49.7

EXPANSION AND F-FACTOR CALC. METHOD

Client: Bradley Landfill
 Location: Sun Valley, CA
 Unit: Flare #3

Date: 4/21/04
 Job #: W07-039
 Run#: 1

Fuel temperature _____ deg. F
 Fuel Pressure _____ psi
 Fuel Flow Rate _____ cfm
 Exhaust Outlet O2 10.67 %
 Barometric Pressure 29.07

Std. Temp. 60 deg. F
 Fuel Flow 1649 dscfm

COMPONENTS		MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen		<u>4.85</u>			0.049
Nitrogen		<u>39.60</u>			0.396
Carbon Dioxide		<u>26.45</u>			0.265
Methane		<u>29.10</u>	293.91	264.64	2.494
Ethane	C2		0.00	0.00	0.000
Propane	C3		0.00	0.00	0.000
Iso-Butane	C4		0.00	0.00	0.000
N-Butane			0.00	0.00	0.000
Iso-Pentane	C5		0.00	0.00	0.000
N-Pentane			0.00	0.00	0.000
Hexane	C6		0.00	0.00	0.000
Heptane	C7		0.00	0.00	0.000
Octane	C8		0.00	0.00	0.000
Nonane	C9		0.00	0.00	0.000
Total		100.00	293.91	264.64	3.20

CALCULATIONS

EXHAUST FLOW RATE, Q = (scfm*Exp Fac)*(20.92/(20.92-%O2))

10781 DSCFM

EPA F-Factor = (scf exhaust/scf fuel)/(btu/scf fuel)*(1000000 btu/MMbtu)

10897 dscf/Mmbtu

EXPANSION AND F-FACTOR CALC. METHOD

Client: Bradley Landfill
 Location: Sun Valley, CA
 Unit: Flare #3

Date: 4/21/04
 Job #: W07-039
 Run#: 2

Fuel temperature _____ deg. F
 Fuel Pressure _____ psi
 Fuel Flow Rate _____ cfm
 Exhaust Outlet O2 10.26 %
 Barometric Pressure 29.07

Std. Temp. 60 deg. F
 Fuel Flow 1623 dscfm

COMPONENTS		MOLE %	HHV btu/ft3	LLV btu/ft3	Exp Factor dscf/scf fuel
Oxygen		<u>4.85</u>			0.049
Nitrogen		<u>39.60</u>			0.396
Carbon Dioxide		<u>26.45</u>			0.265
Methane		<u>29.10</u>	293.91	264.64	2.494
Ethane	C2		0.00	0.00	0.000
Propane	C3		0.00	0.00	0.000
Iso-Butane	C4		0.00	0.00	0.000
N-Butane			0.00	0.00	0.000
Iso-Pentane	C5		0.00	0.00	0.000
N-Pentane			0.00	0.00	0.000
Hexane	C6		0.00	0.00	0.000
Heptane	C7		0.00	0.00	0.000
Octane	C8		0.00	0.00	0.000
Nonane	C9		0.00	0.00	0.000
Total		100.00	293.91	264.64	3.20

CALCULATIONS

EXHAUST FLOW RATE, Q = (scfm*Exp Fac)*(20.92/(20.92-%O2))

10197 DSCFM

EPA F-Factor = (scf exhaust/scf fuel)/(btu/scf fuel)*(1000000 btu/MMbtu)

10897 dscf/MMbtu

SCAQMD Method 307.91

Facility: Bradley Landfill
 Source: Flare #3
 Job No.: W07-039
 Date: 4/21/04

Sulfur Compounds

Speciated Compound		Concentration ppm, as H ₂ S	No. of S molecules in Compound	Total S ppm, as H ₂ S	SO ₂ Conc. mg/dscf	Avg. Inlet Flow Rate dscfm	SO ₂ Rate lb/hr
Hydrogen Sulfide		21.2	1	21.20	1.623	1636	0.351
Carbonyl Sulfide		0.19	1	0.19	0.015	1636	0.003
Methyl mercaptan		1.33	1	1.33	0.102	1636	0.022
Ethyl mercaptan	<	0.09	1	0.09	0.007	1636	0.001
Dimethyl sulfide		5.72	1	5.72	0.438	1636	0.095
Carbon disulfide		0.10	2	0.20	0.015	1636	0.003
Dimethyl disulfide		0.24	2	0.48	0.037	1636	0.008
iso-propyl mercaptan	<	0.06	1	0.06	0.005	1636	0.001
n-propyl mercaptan	<	0.06	1	0.06	0.005	1636	0.001
Total				29.33			0.486

400

Facility: Bradley Landfill
Source: Flare #3
Job No.: W07-039
Date: 4/21/04

STANDARD TEMPERATURE	Degrees F	60			
RUN NUMBER	*****	1	2	1	2
DATE OF RUN	*****	04/21/04	04/21/04	04/21/04	04/21/04
CLOCK TIME: INITIAL	*****	911	1114	911	1114
CLOCK TIME: FINAL	*****	1018	1220	1018	1220
AVG. STACK TEMPERATURE	Degrees F	1587	1577		
AVG. SQUARE DELTA P	Inches H2O	0.1000	0.1000		
NOZZLE DIAMETER	Inches	1.090	1.090		
BAROMETRIC PRESSURE	Inches HG	29.07	29.07		
SAMPLING TIME	Minutes	60	60		
SAMPLE VOLUME	Cubic Feet	63.478	64.386		
AVG. METER TEMP.	Degrees F	69.1	74.3		
AVG. DELTA H	Inches H2O	3.60	3.60		
DGM CALIB. FACTOR [Y]	*****	1.0055	1.0055		
WATER COLLECTED	Milliliters	181	173		
CO 2	Percent	8.92	9.40		
O 2	Percent	10.67	10.26		
CO	Percent				
CH4	Percent				
N 2	Percent	80.41	80.35		
STACK AREA	Square Inches	7238.2	7238.2		
STATIC PRESSURE	Inches WG.	-0.010	-0.010		
PITOT COEFFICIENT	*****	0.84	0.84		
SAMPLE VOLUME DRY	DSCF	61.50	61.77		
WATER AT STD.	SCF	8.5	8.2		
MOISTURE	Percent	12.2	11.7		
MOLE FRACTION DRY GAS	*****	0.88	0.88		
MOLECULAR WT. DRY	lb/lb Mole	29.85	29.91		
EXCESS AIR	Percent	101	94		
MOLECULAR WT. WET	lb/lb Mole	28.41	28.52		
STACK GAS PRESSURE	Inches HG	29.07	29.07		
STACK VELOCITY	AFPM	678	675		
VOLUMETRIC FLOWRATE, DRY STD.	DSCFM	7392	7439	10781	*
VOLUMETRIC FLOWRATE, ACTUAL	ACFM	34099	33946		
ISOKINETIC RATIO	Percent	106	106		

CALCULATIONS FOR GRAIN LOADING AND EMISSION RATES

TOTAL PARTICULATE	mg	7.4	9.8	7.4	9.8
PARTICULATE CONCENTRATION	gr/dscf	0.0019	0.0024	0.0019	0.0024
PARTICULATE EMISSION RATE	lb/hr	0.12	0.16	0.17	0.21

*Denotes the use of calculated flowrate based on expansion factor of LFG.

SCAQMD Method 100.1 Emission Rates

Facility: Bradley Landfill
Source: Flare #3
Job No.: W07-039
Date: 4/21/04

Run Number	*****	1	2
Load	*****	as Found	as Found
EPA F-Factor	dscf/MMBtu	10897	10897
Stack Flow Rate	dscfm	10781	10197
Oxygen	%	10.67	10.26
Carbon Dioxide	%	8.92	9.40

Oxides of Nitrogen

Concentration	ppm	14.8	14.2
Concentration @ 3 % O ₂	ppm	25.9	24.0
Concentration	lb/dscf	1.80E-06	1.73E-06
Emission Rate	lb/MMBtu	4.00E-02	3.69E-02
Emission Rate	lb/hr	1.16	1.06

Carbon Monoxide

Concentration	ppm	<	20.0	<	20.0
Concentration @ 3 % O ₂	ppm	<	35.0	<	33.6
Concentration	lb/dscf	<	1.48E-06	<	1.48E-06
Emission Rate	lb/MMBtu	<	3.29E-02	<	3.16E-02
Emission Rate	lb/hr	<	0.954	<	0.903

Client: Waste Management
 Job No.: W07-039
 Site: Bradley Landfill
 Unit: Flare #3

Date: 04/21/04
 Run #: 1
 Fuel: L.F.G.
 Std. O2: 3

	O2 %	CO2 %	NOx ppm	CO ppm
Range:	25.00	20.00	25.00	100.00
Span:	11.98	7.00	9.93	50.20
Low:				
High:	20.90	11.98	20.40	80.20

**** POST-TEST DRIFT ****

Values				
Zero:	0.00	0.00	0.10	0.00
Span:	12.00	7.00	9.80	49.80

Percent Drift

Zero:	0.00	0.00	0.40	0.00
Span:	0.08	0.00	-0.52	-0.40

**** PRE-TEST BIAS ****

Values				
Zero:	0.30	0.00	0.00	0.00
Span:	12.05	6.85	9.50	49.60

**** POST-TEST BIAS ****

Values				
Zero:	0.25	0.00	0.00	-0.80
Span:	12.10	6.80	9.65	49.20

**** BIAS CORRECTION ****

Zero Average	0.28	0.00	0.00	-0.40
Span Average	12.08	6.83	9.58	49.40

Bias-Corrected Concentration	10.67	8.92	14.83	2.62
Bias-Corrected Conc.(O2 adjusted)			25.95	4.59

**** RAW AVERAGE CONCENTRATION ****

Average:		10.79	8.69	14.30	2.20
O2 adjust:				25.30	3.89
Date	Time	O2	CO2	NOx	CO
21-Apr-04					
21-Apr-04	911	10.53	8.88	15.34	1.46
21-Apr-04	912	10.46	9.00	15.49	1.70
21-Apr-04	913	10.47	8.94	15.57	1.81
21-Apr-04	914	10.63	8.72	15.01	1.92
21-Apr-04	915	10.71	8.78	15.04	1.96
21-Apr-04	916	10.72	8.68	14.72	2.01

21-Apr-04	917	10.69	8.81	15.12	2.11
21-Apr-04	918	10.63	8.81	14.92	2.14
21-Apr-04	919	10.65	8.71	14.62	2.29
21-Apr-04	920	10.94	8.51	14.07	2.43
21-Apr-04	921	10.81	8.59	14.45	2.47
21-Apr-04	922	10.87	8.57	14.46	2.49
21-Apr-04	923	10.83	8.61	14.77	2.59
21-Apr-04	924	10.83	8.64	14.75	2.72
21-Apr-04	925	10.69	8.71	15.00	2.74
21-Apr-04	926	10.60	8.85	14.96	2.93
21-Apr-04	927	10.61	8.74	15.02	3.13
21-Apr-04	928	10.66	8.77	14.90	3.30
21-Apr-04	929	10.68	8.69	14.61	3.43
21-Apr-04	930	10.96	8.48	14.26	3.46
21-Apr-04	931	10.96	8.49	14.08	3.49
21-Apr-04	932	11.08	8.44	13.63	3.37
21-Apr-04	933	10.96	8.51	13.71	3.07
21-Apr-04	934	10.90	8.56	13.75	2.83
21-Apr-04	935	10.90	8.58	13.74	2.64
21-Apr-04	936	10.81	8.62	13.76	2.55
21-Apr-04	937	10.84	8.62	13.84	2.46
21-Apr-04	938	10.81	8.66	13.81	2.36
21-Apr-04	939	10.72	8.68	14.17	2.31
21-Apr-04	940	10.76	8.68	13.99	2.30
21-Apr-04	941	10.69	8.76	14.40	2.33
21-Apr-04	942				Port change
21-Apr-04	948	13.45	8.58	13.39	8.44
21-Apr-04	949	10.75	8.60	13.90	7.21
21-Apr-04	950	10.93	8.44	13.51	4.58
21-Apr-04	951	11.02	8.48	13.47	3.43
21-Apr-04	952	10.95	8.50	13.70	2.66
21-Apr-04	953	10.89	8.63	13.86	2.08
21-Apr-04	954	10.71	8.83	14.35	1.68
21-Apr-04	955	10.49	8.88	14.84	1.43
21-Apr-04	956	10.60	8.83	14.68	1.24
21-Apr-04	957	10.47	8.99	14.98	1.23
21-Apr-04	958	10.36	9.03	15.17	1.18
21-Apr-04	959	10.63	8.70	14.46	1.23
21-Apr-04	960	10.80	8.65	14.23	1.41
21-Apr-04	961	10.73	8.71	14.34	1.40
21-Apr-04	962	10.84	8.57	13.98	1.41
21-Apr-04	963	10.78	8.66	13.88	1.37
21-Apr-04	964	10.87	8.59	13.72	1.40
21-Apr-04	1000	10.86	8.66	13.85	1.27
21-Apr-04	1001	10.77	8.64	13.90	1.15
21-Apr-04	1002	10.77	8.71	14.39	1.04
21-Apr-04	1003	10.70	8.75	14.40	0.99
21-Apr-04	1004	10.68	8.84	14.41	0.97
21-Apr-04	1005	10.51	8.85	14.30	0.96
21-Apr-04	1006	10.58	8.88	14.12	0.96

21-Apr-04	1007	10.69	8.72	13.69	0.99
21-Apr-04	1008	10.65	8.81	13.81	0.99
21-Apr-04	1009	10.73	8.69	13.97	0.94
21-Apr-04	1010	10.71	8.74	13.83	0.97
21-Apr-04	1011	10.78	8.64	13.83	1.01
21-Apr-04	1012	10.85	8.67	13.86	1.01
21-Apr-04	1013	10.80	8.60	13.64	0.96

Client: Waste Management
 Job No.: W07-039
 Site: Bradley Landfill
 Unit: Flare #3

Date: 04/21/04
 Run #: 2
 Fuel: L.F.G.
 Std. O2: 3

	O2 %	CO2 %	NOx ppm	CO ppm
Range:	25.00	20.00	25.00	100.00
Span:	11.98	7.00	9.93	50.20
Low:				
High:	20.90	11.98	20.40	80.20

**** POST-TEST DRIFT ****

Values				
Zero:	0.00	0.00	0.10	0.00
Span:	12.00	7.00	9.80	49.80

Percent Drift

Zero:	0.00	0.00	0.40	0.00
Span:	0.08	0.00	-0.52	-0.40

**** PRE-TEST BIAS ****

Values				
Zero:	0.25	0.00	0.00	-0.80
Span:	12.10	6.80	9.65	49.20

**** POST-TEST BIAS ****

Values				
Zero:	0.75	0.00	0.12	0.00
Span:	12.20	6.60	9.30	49.60

**** BIAS CORRECTION ****

Zero Average	0.50	0.00	0.06	-0.40
Span Average	12.15	6.70	9.48	49.40

Bias-Corrected Concentration	10.26	9.40	14.24	0.92
Bias-Corrected Conc.(O2 adjusted)			23.95	1.55

**** RAW AVERAGE CONCENTRATION ****

Average:		10.47	8.99	13.56	0.51
O2 adjust:				23.29	0.88
Date	Time	O2	CO2	NOx	CO
21-Apr-04					
21-Apr-04	1114	10.15	9.21	14.53	-0.21
21-Apr-04	1115	10.12	9.30	14.34	-0.06
21-Apr-04	1116	10.05	9.32	14.17	0.07
21-Apr-04	1117	10.15	9.15	13.95	0.21
21-Apr-04	1118	10.23	9.13	13.97	0.34
21-Apr-04	1119	10.49	8.78	13.25	0.39

21-Apr-04	1120	10.67	8.75	13.13	0.42
21-Apr-04	1121	10.64	8.88	13.23	0.43
21-Apr-04	1122	10.54	8.89	13.15	0.42
21-Apr-04	1123	10.41	9.05	13.94	0.32
21-Apr-04	1124	10.29	9.20	14.10	0.23
21-Apr-04	1125	10.13	9.27	14.37	0.16
21-Apr-04	1126	10.02	9.29	14.48	0.19
21-Apr-04	1127	10.15	9.15	14.23	0.25
21-Apr-04	1128	10.55	8.67	13.15	0.29
21-Apr-04	1129	10.89	8.50	12.79	0.43
21-Apr-04	1130	11.01	8.46	12.80	0.50
21-Apr-04	1131	10.89	8.67	13.00	0.43
21-Apr-04	1132	10.72	8.76	13.28	0.37
21-Apr-04	1133	10.50	8.96	13.86	0.31
21-Apr-04	1134	10.48	8.96	13.91	0.23
21-Apr-04	1135	10.30	9.10	14.19	0.17
21-Apr-04	1136	10.30	9.11	13.96	0.18
21-Apr-04	1137	10.28	9.05	14.18	0.17
21-Apr-04	1138	10.39	9.00	13.84	0.20
21-Apr-04	1139	10.46	8.80	13.21	0.32
21-Apr-04	1140	10.75	8.67	12.97	0.53
21-Apr-04	1141	10.82	8.60	12.85	0.47
21-Apr-04	1142	10.68	8.87	13.45	0.44
21-Apr-04	1143	10.45	8.99	13.87	0.31
21-Apr-04	1144	10.27	9.23	14.20	0.25
21-Apr-04	1145				Port change
21-Apr-04	1150	14.85	8.85	13.18	4.25
21-Apr-04	1151	10.54	8.79	13.30	4.57
21-Apr-04	1152	10.63	8.79	13.42	3.37
21-Apr-04	1153	10.60	8.85	13.49	2.87
21-Apr-04	1154	10.52	8.84	13.42	2.42
21-Apr-04	1155	10.52	9.04	13.62	2.06
21-Apr-04	1156	10.31	9.03	13.37	1.70
21-Apr-04	1157	10.17	9.28	13.84	1.40
21-Apr-04	1158	10.16	9.21	13.64	1.14
21-Apr-04	1159	10.06	9.26	13.98	0.80
21-Apr-04	1200	10.13	9.26	14.06	0.60
21-Apr-04	1201	10.29	8.96	13.34	0.44
21-Apr-04	1202	10.51	8.86	13.21	0.31
21-Apr-04	1203	10.48	8.91	13.18	0.21
21-Apr-04	1204	10.62	8.76	13.07	0.13
21-Apr-04	1205	10.63	8.75	13.00	0.01
21-Apr-04	1206	10.63	8.88	13.03	-0.08
21-Apr-04	1207	10.43	9.03	13.55	-0.13
21-Apr-04	1208	10.17	9.26	13.92	-0.19
21-Apr-04	1209	10.05	9.39	14.11	-0.26
21-Apr-04	1210	10.00	9.35	13.75	-0.25
21-Apr-04	1211	9.95	9.40	14.13	-0.29
21-Apr-04	1212	10.07	9.12	13.68	-0.29
21-Apr-04	1213	10.43	8.92	13.05	-0.19

21-Apr-04	1214	10.45	8.95	13.16	-0.18
21-Apr-04	1215	10.50	8.93	13.25	-0.22
21-Apr-04	1216	10.48	9.03	13.50	-0.21
21-Apr-04	1217	10.35	8.99	13.28	-0.21
21-Apr-04	1218	10.34	9.00	12.96	-0.22
21-Apr-04	1219	10.34	9.12	13.09	-0.22
21-Apr-04	1220	10.31	8.98	13.07	-0.24

Facility: Waste Management
Source: Flare #3
Job No.: W07-039
Test Date: 4/2104

Method 100.1 Performance Data

PRETEST		CALIBRATION ERROR			
LEAK CHECK					
RANGE :	25	20	100	25	
	O2	CO2	CO	NOx	
ZERO					
Instrument	0.00	0.00	0.00	0.00	
Cylinder	0.00	0.00	0.00	0.00	
Difference (%)	0.00	0.00	0.00	0.00	
LOW LEVEL					
Instrument					
Cylinder					
Difference (%)	0.00	0.00	0.00	0.00	
MID LEVEL					
Instrument	12.10	7.00	50.00	10.00	
Cylinder	11.98	7.00	50.20	9.93	
Difference (%)	0.48	0.00	-0.20	0.28	
HIGH LEVEL					
Instrument	21.00	12.00	81.20	20.50	
Cylinder	20.90	11.98	80.20	20.40	
Difference (%)	0.40	0.10	1.00	0.40	

PRETEST		LINEARITY	
		Cylinder	Instrument
O2			
Zero	0.00	0.00	0.00
High Level	20.90	20.90	21.00
Slope	1.00		
Intercept	0.00		Status
Predicted Value	12.04		<1
Linearity (%)	0.25		PASS
CO2			
Zero	0.00	0.00	0.00
High Level	11.98	11.98	12.00
Slope	1.00		
Intercept	0.00		Status
Predicted Value	7.01		<1
Linearity (%)	0.06		PASS
CO			
Zero	0.00	0.00	0.00
High Level	80.20	80.20	81.20
Slope	0.99		
Intercept	0.00		Status
Predicted Value	50.83		<1
Linearity (%)	0.83		PASS
NOX			
Zero	0.00	0.00	0.00
High Level	20.40	20.40	20.50
Slope	1.00		
Intercept	0.00		Status
Predicted Value	9.98		<1
Linearity (%)	0.09		PASS

POST TEST		CALIBRATION ERROR			
LEAK CHECK					
	O2	CO2	CO	NOx	
ZERO					
Instrument	0.00	0.00	0.00	0.13	
Cylinder	0.00	0.00	0.00	0.00	
Difference (%)	0.00	0.00	0.00	0.50	
LOW LEVEL					
Instrument					
Cylinder					
Difference (%)	0.00	0.00	0.00	0.00	
MID LEVEL					
Instrument	12.00	7.00	49.80	9.88	
Cylinder	11.98	7.00	50.20	9.93	
Difference (%)	0.08	0.00	-0.40	-0.20	
HIGH LEVEL					
Instrument	20.63	11.90	81.00	20.63	
Cylinder	20.90	11.98	80.20	20.40	
Difference (%)	-1.08	-0.40	0.80	0.92	

POST TEST		LINEARITY	
		Cylinder	Instrument
O2			
Zero	0.00	0.00	0.00
High Level	20.90	20.90	20.63
Slope	1.01		
Intercept	0.00		Status
Predicted Value	11.63		<1
Linearity (%)	0.70		PASS
CO2			
Zero	0.00	0.00	0.00
High Level	11.98	11.98	11.90
Slope	1.01		
Intercept	0.00		Status
Predicted Value	6.95		<1
Linearity (%)	0.23		PASS
CO			
Zero	0.00	0.00	0.00
High Level	80.20	80.20	81.00
Slope	0.99		
Intercept	0.00		Status
Predicted Value	50.70		<1
Linearity (%)	0.90		PASS
NOX			
Zero	0.00	0.00	0.13
High Level	20.40	20.40	20.63
Slope	0.99		
Intercept	-0.12		Status
Predicted Value	10.11		<1
Linearity (%)	0.90		PASS

Facility: Waste Management

Source: Flare #3

Job No.: W07-039

Test Date: 4/21/04

Method 100.1 Performance Data

SYSTEM RESPONSE TIME			
	#1	#2	#3
Upscale			
NOx	23		
CO	54		
O2	30		
CO2	22		
Downscale			
NOx	21		
CO	51		
O2	28		
CO2	21		

NO2 CONVERTER EFFICIENCY			
	ppm	%	status
Cylinder(Co)	18.90		
NO Mode(C1)	3.25		
NOx Mode(C2)	17.50		
D1	15.65		
D2	14.25		
D3	1.40		
CE		91.05	
CE > 90 %			PASS

Table 5-2
Trace Organic Species
Destruction Efficiency Results
Waste Management - Bradley Landfill
Flare #1
April 21, 2004

Species	INLET			OUTLET			
	Flow rate	1636	dscfm	Flow rate	10489.2	dscfm	
Species	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)	Conc. (ppb)	Conc. (mg/dscf)	Em. Rate (lb/hr)	Dest. Eff. (%)
Hydrogen Sulfide	212000	8.64E+00	1.87E+00	< 500	< 2.04E-02	< 2.83E-02	> 98.49
Benzene	5000	4.66E-01	1.01E-01	< 0.2	< 1.86E-05	< 2.59E-05	> 99.97
Benzylchloride	< 40	< 6.07E-03	< 1.31E-03	< 0.8	< 1.21E-04	< 1.68E-04	NA
Chlorobenzene	256	3.46E-02	7.48E-03	< 0.2	< 2.70E-05	< 3.75E-05	> 99.50
Dichlorobenzenes	1950	3.43E-01	7.41E-02	< 1.1	< 1.93E-04	< 2.68E-04	> 99.64
1,1-dichloroethane	144	1.70E-02	3.69E-03	< 0.2	< 2.37E-05	< 3.28E-05	> 99.11
1,2-dichloroethane	40	4.74E-03	1.03E-03	< 0.2	< 2.37E-05	< 3.28E-05	> 96.80
1,1-dichloroethylene	45	5.17E-03	1.12E-03	< 0.2	< 2.32E-05	< 3.22E-05	> 97.12
Dichloromethane	344	3.49E-02	7.56E-03	0.26	2.64E-05	3.66E-05	99.52
1,2-Dibromoethane	< 30	< 6.74E-03	< 1.46E-03	< 0.2	< 4.49E-05	< 6.23E-05	NA
Perchloroethene	1360	3.85E-01	8.34E-02	< 0.1	< 2.83E-05	< 3.93E-05	> 99.95
Carbon tetrachloride	< 30	< 5.52E-03	< 1.19E-03	< 0.1	< 1.84E-05	< 2.55E-05	NA
Toluene	27400	3.01E+00	6.52E-01	0.69	7.59E-05	1.05E-04	99.98
1,1,1-trichloroethane	< 20	< 3.18E-03	< 6.88E-04	< 0.1	< 1.59E-05	< 2.21E-05	NA
Trichloroethene	482	7.55E-02	1.63E-02	< 0.1	< 1.57E-05	< 2.17E-05	> 99.87
Chloroform	< 20	< 2.84E-03	< 6.16E-04	< 0.1	< 1.42E-05	< 1.97E-05	NA
Vinyl Chloride	< 20	1.49E-03	3.23E-04	< 0.2	< 1.49E-05	< 2.07E-05	NA
m+p-xylenes	20400	2.58E+00	5.59E-01	0.48	6.08E-05	8.44E-05	99.98
o-xylene	3000	3.80E-01	8.22E-02	< 0.2	< 2.53E-05	< 3.52E-05	> 99.96
TNMHC	12019325	2.30E+02	4.97E+01	6100	1.17E-01	1.62E-01	99.67

Note: All values preceded by "<" are below the detection limit. The reported values are the detection limit.

NA-Not Applicable: Destruction efficiency can not be calculated since both inlet and outlet values are below the detection limit.

APPENDIX C - Laboratory Results



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LABORATORY ANALYSIS REPORT

CO, CH₄, CO₂, TGNMO, and Ethane Analysis in Tanks
and Traps by SCAQMD Method 25 (FID/TCA)

Report Date: May 5, 2004
Client: Horizon / Waste Management
P.O. No.: Verbal
Client Project No.: E07-039
Source Location: Bradley Landfill
Source ID: Flare 3, In

Date Received: April 21, & 29, 2004
Date Analyzed: April 23, & 30, 2004

AtmAA Lab No.	Sample ID			tank CO	tank CH ₄	tank CO ₂	tank Ethane	tank TGNMO	trap CO ₂ in ICV	tank Oxygen	P ₁	
	Tank	Trap	ICV	(Concentrations in ppmv)						(%)		
01124-32	O	B	I	221	291000	265000	143	5210	20000	4.92	468	810
01124-33	N	Z	30	213	291000	264000	133	2130	36200	4.78	486	820

trap burn system blank H

7.01

TGNMO is total gaseous non-methane organics (excluding ethane) reported as ppm methane.
Ethane is reported as ppmv methane.

P₁ - Initial Pressure, mm Hg

P₂ - Final Pressure, mm Hg


Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY
(Repeat Analyses)

Client Project No.: E07-039

Date Received: April 21, & 29, 2004

Date Analyzed: April 23, & 30, 2004

Components	Sample ID	Repeat Analysis		Mean Conc.	% Diff. From Mean
		Run #1	Run #2		
		(Concentration in ppmv)			
CO	TK O	226	215	221	2.5
CH ₄	TK O	290000	292000	291000	0.34
CO ₂	TK O	265000	265000	265000	0.0
TGNMO	TK O	5360	5060	5210	2.9
Ethane	TK O	148	137	143	3.7
CO ₂ in ICV (in trap, transfer tanks)	ICV I	20100	20000	20000	0.25
Oxygen	TK O	4.82	5.02	4.92	2.0

A set of 2 TCA samples, laboratory numbers 01124-32 & 33, was analyzed for CO, CH₄, CO₂, total gaseous non-methane organics (TGNMO), and ethane. Agreement between repeat analyses is a measure of precision and is shown above in the column "% Difference from Mean". Repeat analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean for 7 repeat measurements from the sample set of 2 TCA samples is 1.7%.

Gas standards (containing CO, CH₄, CO₂ and isobutane) used for TCA analyses, were prepared and certified by Praxair.





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LABORATORY ANALYSIS REPORT

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Organic Carbon Analysis in Water Impingers, and Methane and TGNMO Analysis in
SUMMA Canister Samples from Impinger/Canister Train Sample Collection

Report Date: April 28, 2004

Client: Horizon

P.O. No.: Verbal

Client Project No.: W07-039

Source Location : Waste Management / Bradley Landfill / Sun Valley CA.

Date Received: April 21, 2004

Date Analyzed: April 23, & 27, 2004


ANALYSIS DESCRIPTION

Methane & TGNMO were measured by flame ionization detection/total combustion analysis (FID/TCA), Method 25. Organic carbon in water impinger samples were measured by Dohrman total organic carbon analyzer, water FID/TCA.

AtmAA Lab No.	Sample ID	Canister	Canister	Canister	Impinger Organic Carbon as	Impinger	P ₁	P ₂
		Methane	Ethane	TGNMO	Methane	Volume		
		(Concentration in ppmv)			(ppmv)	(ml)		
01124-34	SUMMA S6	<1	<1	3.90	---	---	592	820
	Impinger 18H	---	---	---	3.92	2.14	---	---
01124-35	SUMMA S17	<1	<1	3.22	---	---	582	820
	Impinger 16H	---	---	---	1.16	2.14	---	---

*TGNMO is total gaseous non-methane organics (excluding ethane), reported as ppm methane.
Ethane is reported as ppmv methane.*

** Note - Impinger sample results are not blank corrected. The field blank (impinger H24),
contained 1.65 ug carbon as methane, corresponding to 0.55 ppm methane for a 4.62 liter sample.
P₁ and P₂ are initial and final pressures measured in mm Hg.*


Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY
(Repeat Analyses)

Project No.: W07-039
Date Received: April 21, 2004
Date Analyzed: April 23, & 27, 2004

Components	Sample ID	Repeat Analysis		Mean Conc.	% Diff. From Mean
		Run #1	Run #2		
		(Concentration in ppmv)			
Methane	SUMMA S6	<1	<1	---	---
	SUMMA S17	<1	<1	---	---
Ethane	SUMMA S6	<1	<1	---	---
	SUMMA S17	<1	<1	---	---
TGNMO	SUMMA S6	3.87	3.93	3.90	0.77
	SUMMA S17	2.96	3.47	3.22	7.9
Impinger TOC	Impinger 18H	3.86	3.97	3.92	1.4
	Impinger 16H	1.16	1.15	1.16	0.43

A set of 2 canister/impinger samples, laboratory numbers 01124-(34 - 35), was analyzed for methane, ethane, total gaseous non-methane organics (TGNMO), and TOC. Agreement between repeat analysis is a measure of precision and is shown in the column "% Difference from Mean". Repeat analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean for 4 repeat measurements from the sample set of 2 canister/impinger samples is 2.6%.





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LABORATORY ANALYSIS REPORT

SCAQMD Rule 1150.1 Components Analysis in Inlet Gas Tedlar Bag Sample

Report Date: April 27, 2004
Client: Horizon
Project Location: Waste / Bradley Landfill
Client Project No.: W07-039
Date Received: April 21, 2004
Date Analyzed: April 21, 2004

AtmAA Lab No.: 01124-36
Sample I.D.: W07039-F#3

IN-TB-1


Components
Hydrogen sulfide

(Concentration in ppmv)
21.2

(Concentration in ppbv)

Benzene	5000
Benzylchloride	<40
Chlorobenzene	256
Dichlorobenzenes*	1950
1,1-dichloroethane	144
1,2-dichloroethane	40.1
1,1-dichloroethylene	44.6
Dichloromethane	344
1,2-dibromoethane	<30
Perchloroethene	1360
Carbon tetrachloride	<30
Toluene	27400
1,1,1-trichloroethane	<20
Trichloroethene	482
Chloroform	<20
Vinyl chloride	392
m+p-xylenes	20400
o-xylene	3000

* total amount containing meta, para, and ortho isomers


Michael L. Porter
Laboratory Director



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LABORATORY ANALYSIS REPORT

Hydrogen Sulfide and Reduced Sulfur Compounds
Analysis in Inlet Tedlar Bag Sample

Report Date: April 27, 2004

Client: Horizon

Project Location: Waste / Bradley Landfill

Client Project No.: W07-039

Date Received: April 21, 2004

Date Analyzed: April 21, 2004

ANALYSIS DESCRIPTION

Hydrogen sulfide was analyzed by gas chromatography with a Hall electrolytic conductivity detector operated in the oxidative sulfur mode. All other components were measured by GC/ Mass Spec.

AtmAA Lab No.: 01124-36

Sample I.D.: W07039-F#3

IN-TB-1

Components

(Concentration in ppmv)

Hydrogen sulfide	21.2
Carbonyl sulfide	0.19
Methyl mercaptan	1.33
Ethyl mercaptan	<0.09
Dimethyl sulfide	5.72
Carbon disulfide	0.10
isopropyl mercaptan	<0.06
n-propyl mercaptan	<0.06
Dimethyl disulfide	0.24
TRS	29.1

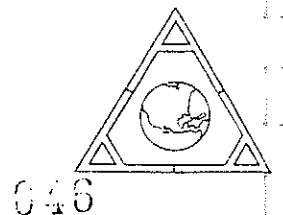
TRS - total reduced sulfur


Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY
(Repeat Analyses)

Client Project No.: W07-039
Date Received: April 21, 2004
Date Analyzed: April 21, 2004

Components	Sample ID	Repeat Analysis		Mean Conc.	% Diff. From Mean
		Run #1	Run #2		
(Concentration in ppbv)					
Benzene	W07039-F#3-IN-TB-1	4950	5050	5000	1.0
Benzylchloride	W07039-F#3-IN-TB-1	<40	<40	---	---
Chlorobenzene	W07039-F#3-IN-TB-1	255	256	256	0.20
Dichlorobenzenes	W07039-F#3-IN-TB-1	2020	1880	1950	3.6
1,1-dichloroethane	W07039-F#3-IN-TB-1	144	143	144	0.35
1,2-dichloroethane	W07039-F#3-IN-TB-1	38.3	41.9	40.1	4.5
1,1-dichloroethylene	W07039-F#3-IN-TB-1	42.7	46.6	44.6	4.4
Dichloromethane	W07039-F#3-IN-TB-1	345	343	344	0.29
1,2-dibromoethane	W07039-F#3-IN-TB-1	<30	<30	---	---
Perchloroethene	W07039-F#3-IN-TB-1	1350	1360	1360	0.37
Carbon tetrachloride	W07039-F#3-IN-TB-1	<30	<30	---	---
Toluene	W07039-F#3-IN-TB-1	27300	27600	27400	0.55
1,1,1-trichloroethane	W07039-F#3-IN-TB-1	<20	<20	---	---
Trichloroethene	W07039-F#3-IN-TB-1	476	487	482	1.1
Chloroform	W07039-F#3-IN-TB-1	<20	<20	---	---
Vinyl chloride	W07039-F#3-IN-TB-1	388	396	392	1.0
m+p-xylenes	W07039-F#3-IN-TB-1	20400	20500	20400	0.24
o-xylene	W07039-F#3-IN-TB-1	2990	3010	3000	0.33



QUALITY ASSURANCE SUMMARY
(Repeat Analyses)
(continued)

Sulfur Components	Sample ID	Repeat Analysis		Mean Conc.	% Diff. From Mean
		Run #1	Run #2		
		(Concentration in ppmv)			
Hydrogen sulfide	W07039-F#3-IN-TB-1	20.9	21.5	21.2	1.4
Carbonyl sulfide	W07039-F#3-IN-TB-1	0.19	0.19	0.19	0.0
Methyl mercaptan	W07039-F#3-IN-TB-1	1.33	1.33	1.33	0.0
Ethyl mercaptan	W07039-F#3-IN-TB-1	<0.09	<0.09	---	---
Dimethyl sulfide	W07039-F#3-IN-TB-1	5.69	5.76	5.72	0.61
Carbon disulfide	W07039-F#3-IN-TB-1	0.10	0.10	0.10	0.0
iso-propyl mercaptan	W07039-F#3-IN-TB-1	<0.06	<0.06	---	---
n-propyl mercaptan	W07039-F#3-IN-TB-1	<0.06	<0.06	---	---
Dimethyl disulfide	W07039-F#3-IN-TB-1	0.23	0.25	0.24	4.2

One Tedlar bag sample, laboratory number 01124-36, was analyzed for SCAQMD Rule 1150.1 components, hydrogen sulfide, and total reduced sulfur compounds. Agreement between repeat analyses is a measure of precision and is shown above in the column "% Difference from Mean". Repeat analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean for 19 repeat measurements from the one Tedlar bag sample is 1.3%.





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LABORATORY ANALYSIS REPORT

SCAQMD Rule 1150.1 Components Analysis in Outlet Tedlar Bag Sample

Report Date: April 27, 2004

Client: Horizon

Project Location: Waste / Bradley Landfill

Client Project No.: W07-039

Date Received: April 21, 2004

Date Analyzed: April 21, 2004

AtmAA Lab No.: 01124-37

Sample I.D.: W07039-F#3


EXH-TB-1

Components

(Concentration in ppbv)

Hydrogen sulfide	<500
Benzene	<0.2
Benzylchloride	<0.8
Chlorobenzene	<0.2
Dichlorobenzenes*	<1.1
1,1-dichloroethane	<0.2
1,2-dichloroethane	<0.2
1,1-dichloroethylene	<0.2
Dichloromethane	0.26
1,2-dibromoethane	<0.2
Perchloroethene	<0.1
Carbon tetrachloride	<0.1
Toluene	0.69
1,1,1-trichloroethane	<0.1
Trichloroethene	<0.1
Chloroform	<0.1
Vinyl chloride	<0.2
m+p-xylenes	0.48
o-xylene	<0.2

* total amount containing meta, para, and ortho isomers


Michael L. Porter
Laboratory Director

QUALITY ASSURANCE SUMMARY
(Repeat Analyses)

Client Project No.: W07-039
Date Received: April 21, 2004
Date Analyzed: April 21, 2004

Components	Sample ID	Repeat Analysis		Mean Conc.	% Diff. From Mean
		Run #1	Run #2		
		(Concentration in ppbv)			
Hydrogen sulfide	W07039-F#3-EXH-TB-1	<500	<500	---	---
Benzene	W07039-F#3-EXH-TB-1	<0.2	<0.2	---	---
Benzylchloride	W07039-F#3-EXH-TB-1	<0.8	<0.8	---	---
Chlorobenzene	W07039-F#3-EXH-TB-1	<0.2	<0.2	---	---
Dichlorobenzenes	W07039-F#3-EXH-TB-1	<1.1	<1.1	---	---
1,1-dichloroethane	W07039-F#3-EXH-TB-1	<0.2	<0.2	---	---
1,2-dichloroethane	W07039-F#3-EXH-TB-1	<0.2	<0.2	---	---
1,1-dichloroethylene	W07039-F#3-EXH-TB-1	<0.2	<0.2	---	---
Dichloromethane	W07039-F#3-EXH-TB-1	0.30	0.23	0.26	13
1,2-dibromoethane	W07039-F#3-EXH-TB-1	<0.2	<0.2	---	---
Perchloroethene	W07039-F#3-EXH-TB-1	<0.1	<0.1	---	---
Carbon tetrachloride	W07039-F#3-EXH-TB-1	<0.1	<0.1	---	---
Toluene	W07039-F#3-EXH-TB-1	0.67	0.71	0.69	2.9
1,1,1-trichloroethane	W07039-F#3-EXH-TB-1	<0.1	<0.1	---	---
Trichloroethene	W07039-F#3-EXH-TB-1	<0.1	<0.1	---	---
Chloroform	W07039-F#3-EXH-TB-1	<0.1	<0.1	---	---
Vinyl chloride	W07039-F#3-EXH-TB-1	<0.2	<0.2	---	---
m+p-xylenes	W07039-F#3-EXH-TB-1	0.47	0.49	0.48	2.1
o-xylene	W07039-F#3-EXH-TB-1	<0.2	<0.2	---	---

One Tedlar bag sample, laboratory number 01124-37, was analyzed for SCAQMD Rule 1150.1 components. Agreement between repeat analyses is a measure of precision and is shown above in the column "% Difference from Mean". Repeat analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean for 3 repeat measurements from one Tedlar bag sample is 6.0%.



CHAIN OF CUSTODY RECORD

Client/Project Name Waste / Bouillon LIRE			Project Location San Valley, CA		
Project No. W074039			Field Logbook No.		
Sampler: (Signature) <i>[Signature]</i>			Chain of Custody Tape No.		

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	ANALYSES					REMARKS	
TRAP # 120	04/21/04		01124-32		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				18H 16H	TR 18H 16H
SN					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
Summit # 50							<input checked="" type="checkbox"/>				
517							<input checked="" type="checkbox"/>				
W074039-F#3-In-TB-1							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
W074039-F#3-In-TB-2									<input checked="" type="checkbox"/>		
W074039-F#3-Ex-TB-1			-33								
W074039-F#3-Ex-TB-2			-34								
W074039-F#3-Ex-TB-1			-35								
W074039-F#3-Ex-TB-2			-36								
W074039-F#3-Ex-TB-1			-37								
W074039-F#3-Ex-TB-2											

Relinquished by: (Signature) <i>[Signature]</i>	Date 4/21/04	Time 1345	Received by: (Signature) <i>[Signature]</i>	Date 4/21/04	Time 1345
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR		ANALYTICAL LABORATORY	
HORIZON AIR MEASUREMENT SERVICES, INC 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781 Fax (805) 498-3173		At MAA	
		Nº 8504	

CHAIN OF CUSTODY RECORD

Client/Project Name <i>Waste Management / Bradley</i>			Project Location <i>San Valley, CA</i>			<div style="text-align: center;">ANALYSES</div> <div style="display: flex; justify-content: space-around;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">COR</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">TRAP</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">TANK</div> </div>					
Project No. <i>W07.039</i>			Field Logbook No.								
Sampler: (Signature) <i>[Signature]</i>			Chain of Custody Tape No.								

Sample No. / Identification	Date	Time	Lab Sample Number	Type of Sample					REMARKS
<i>ICV# H</i>	<i>11-24-04</i>			<i>SCAQMD 25.1</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>System Blank</i>
<i>I</i>					<input checked="" type="checkbox"/>	<i>B</i>	<i>O</i>		<i>> FLARE 3</i>
<i>30</i>					<input checked="" type="checkbox"/>	<i>Z</i>	<i>N</i>		
<i>12</i>					<input checked="" type="checkbox"/>	<i>U</i>	<i>C</i>		<i>> FLARE 1</i>
<i>6</i>					<input checked="" type="checkbox"/>	<i>Y1</i>	<i>I</i>		
<i>27</i>					<input checked="" type="checkbox"/>	<i>Y</i>	<i>H</i>		<i>> FLARE 2</i>
<i>3</i>					<input checked="" type="checkbox"/>	<i>M</i>	<i>B</i>		

Relinquished by: (Signature) <i>[Signature]</i>	Date	Time	Received by: (Signature) <i>[Signature]</i>	Date	Time
				<i>11-29-04</i>	<i>4:00</i>
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
Sample Disposal Method:	Disposed of by: (Signature)			Date	Time

SAMPLE COLLECTOR		ANALYTICAL LABORATORY	
HORIZON AIR MEASUREMENT SERVICES, INC 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781 Fax (805) 498-3173		<i>ATM. A.A.</i> <i>Calabasas, CA</i>	
		No: 7486	

Facility: WASTE MANAGEMENT

SCAQMD Method 5.1

Source: FLARE 3

Job No.: W07-039

Test Date: 04/20-21/04

DATA SHEET FOR PARTICULATE MATTER SCAQMD METHOD 5.1

DATE SAMPLED: 04/20-21/04

RUN #1

DATE EXTRACTED: 05/03/04

	SAMPLE ID	BEAKER/ FILTER ID	VOLUME	INITIAL	FINAL	NET WEIGHT(g)
A - FILTER CATCH FILTER ACID FILTER SULFATE	W07039-F#3-M5-PF1	Q00129	NA	0.1513	0.1526	0.0013 0.0000
B - PROBE CATCH PROBE ACID PROBE SULFATE						0.0000 0.0000
C - IMP.CATCH(INSOL) INSOLUBLE ACID INSOLUBLE SULFATE	W07039-F#3-M5-EF1	Q00135	825	0.1545	0.1555	0.0010 0.0000 0.0000
D - IMP. CATCH (SOL) SOLUBLE ACID SOLUBLE SULFATE	W07039-F#3-M5-R1	040104	825	29.7767	29.7803	0.0036 0.0000 0.0000
E - ORGANIC EXTRACT	W07039-F#3-M5-MC1	040109	125	29.6399	29.6414	0.0015
<hr/>						
TOTAL PARTICULATE	(A+B+C+D+E)					0.0074
SOLID PARTICULATE	(A+B+C+D)					0.0059

Facility: WASTE MANAGEMENT
Source: FLARE 3
Job No.: W07-039
Test Date: 04/20-21/04

SCAQMD Method 5.1

DATA SHEET FOR PARTICULATE MATTER SCAQMD METHOD 5.1

DATE SAMPLED: 04/20-21/04
DATE EXTRACTED: 05/03/04

RUN #2

	SAMPLE ID	BEAKER/ FILTER ID	VOLUME	INITIAL	FINAL	NET WEIGHT(g)
A - FILTER CATCH FILTER ACID FILTER SULFATE	W07039-F#3-M5-PF2	Q00130	NA	0.1519	0.1529	0.0010 0.0000
B - PROBE CATCH PROBE ACID PROBE SULFATE						0.0000 0.0000
C - IMP.CATCH(INSOL) INSOLUBLE ACID INSOLUBLE SULFATE	W07039-F#3-M5-EF2	Q00134	850	0.1535	0.1540	0.0005 0.0000 0.0000
D - IMP. CATCH (SOL) SOLUBLE ACID SOLUBLE SULFATE	W07039-F#3-M5-R2	040111	850	29.6280	29.6341	0.0061 0.0000 0.0000
E - ORGANIC EXTRACT	W07039-F#3-M5-MC2	040115	125	29.8932	29.8954	0.0022
TOTAL PARTICULATE (A+B+C+D+E)						0.0098
SOLID PARTICULATE (A+B+C+D)						0.0076

Facility: WASTE MANAGEMENT
Source: BLANK
Job No.: W07-039
Test Date: 04/20-21/04

SCAQMD Method 5.1

DATA SHEET FOR PARTICULATE MATTER SCAQMD METHOD 5.1

DATE SAMPLED: 04/20-21/04
DATE EXTRACTED: 05/03/04

BLANK

	SAMPLE ID	BEAKER/ FILTER ID	VOLUME	INITIAL	FINAL	NET WEIGHT(g)
A - FILTER CATCH FILTER ACID FILTER SULFATE	PF-BLANK	Q00138	NA	0.1460	0.1458	0.0000 0.0000 0.0000 0.0000
B - PROBE CATCH PROBE ACID PROBE SULFATE						0.0000 0.0000
C - IMP.CATCH(INSOL) INSOLUBLE ACID INSOLUBLE SULFATE	EF-BLANK	Q00137	1000	0.1488	0.1486	0.0000 0.0000 0.0000
D - IMP. CATCH (SOL) SOLUBLE ACID SOLUBLE SULFATE	DI-BLANK	040119	1000	29.4336	29.4333	0.0000 0.0000 0.0000
E - ORGANIC EXTRACT	MC-BLANK	040118	125	29.5282	29.5285	0.0003

TOTAL PARTICULATE	(A+B+C+D+E)					0.0003
SOLID PARTICULATE	(A+B+C+D)					0.0000

CHAIN OF CUSTODY RECORD

Client/Project Name <i>Waste Management</i>			Project Location <i>Bridley LF</i>			ANALYSES							
Project No. <i>W07-039</i>			Field Logbook No.										
Sampler: (Signature) <i>[Signature]</i>			Chain of Custody Tape No.										
Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	REMARKS								
<i>W07039-E#3 - M6 - R-1</i>				<i>X</i>									
<i>W07039-E#3 - M6 - PF-2</i>				<i>X</i>									
<i>W07039-E#3 - M6 - R-1</i>				<i>X</i>									
<i>W07039-E#3 - M6 - R-2</i>				<i>X</i>									
Relinquished by: (Signature) <i>[Signature]</i>				Date <i>04/21/04</i>	Time <i>1800</i>	Received by: (Signature) <i>[Signature]</i>				Date	Time		
Relinquished by: (Signature)				Date	Time	Received by: (Signature)				Date	Time		
Relinquished by: (Signature)				Date	Time	Received for Laboratory: (Signature) <i>[Signature]</i>				Date <i>04.21.04</i>	Time <i>1800</i>		
Sample Disposal Method:				Disposed of by: (Signature)				Date	Time				
SAMPLE COLLECTOR HORIZON AIR MEASUREMENT SERVICES, INC 996 Lawrence Drive, Suite 108 Newbury Park, CA 91320 (805) 498-8781 Fax (805) 498-3173				ANALYTICAL LABORATORY				No 7414					

SECOND MATH 6:

APPENDIX D - Field Data Sheets

VELOCITY DATA SHEET - METHOD 2

Facility: Bradley LRP
Source: Flare #3 In
Job #: WO 7-237
Date: 04/21/04
Operator: EC

Baro. Press: 29.04 D
Static Press: 19.6" H₂O D
Pitot Tube #: STD 24 S
Pitot Tube Type: STD
Magnahelic: R90708637 11

D₁ upstream: 2.4
D₁ downstream: 4.8
Stack Diameter: 10

Leak Check

Initial: _____ **Final:** _____

Run #: 1

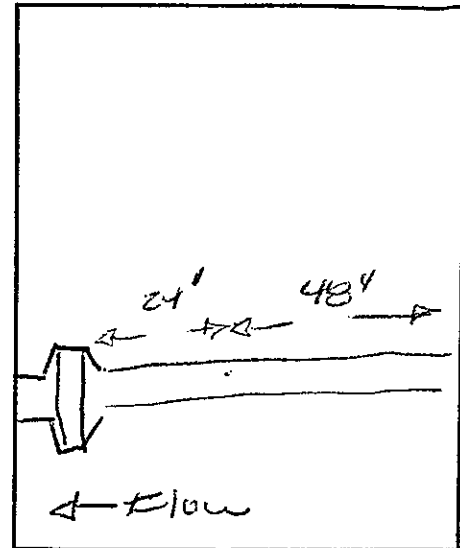
Initial: Final:

✓/✓ ✓/✓

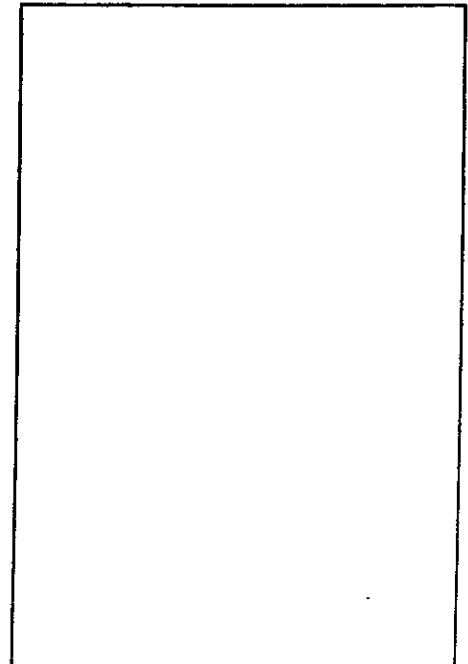
Point #	Position in.	Velocity Head in. H ₂ O	Stack Temp °F	Cyclonic Flow Angle
A-B		0.74	154	
7		0.85	154	
6		0.96	154	
5		0.98	154	
4		0.84	154	
3		0.90	154	
2		0.91	154	
1		0.84	154	
Average		$\sqrt{\Delta P} = 0.9379$	$T_s = 154.0$	$\angle =$

re m

Side View



Top View



100

[illegible][illegible]

Project	Start Date	End Date	Status	Progress (%)	Comments
Project A	2023-01-15	2023-03-31	Completed	100	Exceeded expectations
Project B	2023-02-01	2023-04-15	In Progress	75	Minor delays
Project C	2023-03-01	2023-05-31	On Hold	0	Resource allocation
Project D	2023-04-01	2023-06-30	Planned	0	Initial planning
Project E	2023-05-01	2023-07-31	On Hold	0	Waiting for funding
Project F	2023-06-01	2023-08-31	Planned	0	Initial planning
Project G	2023-07-01	2023-09-30	On Hold	0	Waiting for funding
Project H	2023-08-01	2023-10-31	Planned	0	Initial planning
Project I	2023-09-01	2023-11-30	On Hold	0	Waiting for funding
Project J	2023-10-01	2023-12-31	Planned	0	Initial planning

[illegible]

ASSUMED MOISTURE, % *WA*
 AMBIENT TEMPERATURE *70°F*
 BARO. PRESS. *29.09*
 STATIC PRESS. *NA*
 NOMOGRAPH INDEX *NA*

TIME START 0911

PRE TEST LEAK CHECKS
 METER 0.04 @ 5 in. Hg
 PITOTS @ _____ in. Hg
 ORSAT _____

[illegible]

TIME END = 12:11

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght.
	1	2	3	4	5
Final	134	104	4		256
Initial	100	100	0		243
Liquid Collected	34	4	4		13
Total Vol. Collected					550

POST TEST LEAK CHECKS

Meter 49.00 @ in. Hg
Pitots @ in. Hg
Orsat

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					

Nozzle Cal	D ₁	D ₂	D ₃	Average

PLANT Broadway LFRC
DATE 04/21/01
LOCATION San Valley, CA
OPERATOR NE, RW
SOURCE Flow Meters
RUN NO. 2 - 4th month 4-1
SAMPLE BOX NO. C-9
TIME START 11/4

METER BOX NO. _____

METER ΔH @ _____

Y = _____

PROBE I.D. NO. _____

NOZZLE DIAMETER, in. _____

STACK DIAMETER, in. _____

PROBE HEATER SETTING _____

HEATER BOX SETTING _____

ΔC_p FACTOR _____

FILTER NO. _____

ASSUMED MOISTURE, % N/A
 AMBIENT TEMPERATURE 29.0 F
 BARO. PRESS. 809.2
 STATIC PRESS. N/A
 NOMOGRAPH INDEX N/A

PRE TEST LEAK CHECKS

METER 0.01 @ 5 in. Hg
 PITOTS @ in. Hg
 ORSAT

[illegible]

TIME END = 1214

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght.
	1	2	3	4	5
Final	133	102	41		280
Initial	100	100	0		246
Liquid Collected					
Total Vol. Collected					53.0

re

Meter 40.001 @ 5 in. Hg
Pitots @ in. Hg
Orsat

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					
Nozzle Cal	D ₁	D ₂	D ₃	Average	
				660	

**TOTAL COMBUSTION ANALYSIS
SCAQMD METHOD 25
FIELD SAMPLING DATA SHEET**

Job #: 007-039
Facility: Brockley L-2C
Location: Sun Valley, CA
Date: 04/21/04
Operator: 12C

Control Device: 46 Flare #3
Sample Location: Inlet
Ambient Temp.: ~75°F
Baro. Pressure: 29.07

SAMPLE A

Tank #: 0 Trap #: 13
Initial Vacuum: 2.5
Final Vacuum: _____
Start Time: _____

SAMPLE B

Tank #: N Trap #: 7
Initial Vacuum: 2.5
Final Vacuum: _____
End Time: _____

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	29	100
05	27.5	100
10	26	100
15	24.5	100
20	23	100
25	21.5	100
30	20	100
35	18.5	100
40	17	100
45	15.5	100
50	14	100
55	12.5	100
60	11	

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	29	100
05	27.5	100
10	26	100
15	24.5	100
20	23	100
25	21.5	100
30	20	100
35	18.5	100
40	17	100
45	16.5	100
50	14	100
55	12.5	100
60	11	

LEAK RATE

Pre Test : ✓/✓
Post Test: ✓/✓

PLANT Woolly LFLL
DATE 06/10/04
LOCATION San Ysidro
OPERATOR Ally
SOURCE Flow #3
RUN NO. 1 - SCSWD G-1
SAMPLE BOX NO. 1-1

METER BOX NO. _____
METER ΔH @ _____
Y= _____
PROBE I.D. NO. _____
NOZZLE DIAMETER, in. _____
STACK DIAMETER, in. _____
PROBE HEATER SETTING _____
HEATER BOX SETTING _____
 ΔC_p FACTOR _____
FILTER NO. _____

ASSUMED MOISTURE, % 10
 AMBIENT TEMPERATURE ~ 70°F
 BARO. PRESS. 29.07
 STATIC PRESS. -0.01
 NOMOGRAPH INDEX 300

PRE TEST LEAK CHECKS
METER 0.011 @ 14 in. Hg
PITOTS ✓ / 0 @ 25 in. Hg
ORSAT

TIME START -0711

P#	TIME	T _s °F	ΔP in H ₂ O	√ΔP	ΔH in H ₂ O	Vm ft ³	T _{in} °F	T _{out} °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
A-12	00	1601	0.01		3.6	001.806	63	63	NA	62	I
112	10	1583	0.01		3.6	004.3	67	63		56	I
104	10	1581	0.01		3.6	006.9	67	63		55	I
97	10	1583	0.01		3.6	009.6	68	64		52	I
810	20	1572	0.01		3.6	012.2	68	64		51	I
712	20	1599	0.01		3.6	015.0	69	65		52	I
6140	30	1607	0.01		3.6	017.5	69	65		53	I
512	30	1600	0.01		3.6	020.1	70	66		54	I
420	30	1560	0.01		3.6	022.8	70	66		55	I
322	30	1577	0.01		3.6	025.4	71	66		55	I
224	40	1586	0.01		3.6	028.1	71	67		56	I
122	40	1584	0.01		3.6	030.8	71	67		56	I
B-130	40	1587	0.01		3.6	033.623	68	67		57	I
1011	40	1560	0.01		3.6	036.1	70	68		57	I
104	50	1586	0.01		3.6	038.7	71	69		58	I
934	50	1587	0.01		3.6	041.4	72	69		58	I
840	50	1590	0.01		3.6	044.0	73	69		57	I
742	50	1597	0.01		3.6	046.7	73	69		55	I
6	46	1506	0.01		3.6	044.0	73	69		56	I
6	47.6	1591	0.01		3.6	046.7	74	70		57	I
4	50	1595	0.01		3.6	054.8	74	70		58	I
3	52.5	1596	0.01		3.6	057.3	74	70		57	I
2	550	1590	0.01		3.6	059.9	74	70		56	I
1	570	1584	0.01		3.6	062.6	75	71		55	I
	600					065.284					
Avg		1586.8		0.1090	3.60	63.598		68.9			

TIME END =

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght.
	1	2	3	4	5
Final	242	118	8		262
Initial	100	100	0		249
Liquid Collected	142	18	8		13
Total Vol. Collected					181

HORIZON AIR MEASUREMENT SERVICES, INC.

POST TEST LEAK CHECKS

Meter 0.915 @ 8 in. Hg
Pitots ✓ @ >>>3 in. Hg
Orsat _____

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3				0.2	
Nozzle Cal	D ₁	D ₂	D ₃	Average	

PARTICULATE FIELD DATA

PLANT Bridgely LTR
 DATE 09/21/01
 LOCATION Sun Valley, CA
 OPERATOR Deegan, RW
 SOURCE Flour #3
 RUN NO. 2 - 500gms each 5.1
 SAMPLE BOX NO. C-2
 TIME START 1114

METER BOX NO. 4
 METER ΔH @ 1.7007
 Y= 1.0055
 PROBE I.D. NO. 10-2
 NOZZLE DIAMETER, in. 1.09
 STACK DIAMETER, in. 96"
 PROBE HEATER SETTING N/A
 HEATER BOX SETTING N/A
 Δ Cp FACTOR 0.84
 FILTER NO. Q00130

ASSUMED MOISTURE, % 10
 AMBIENT TEMPERATURE ~80°F
 BARO. PRESS. 29.07
 STATIC PRESS. -0.01
 NOMOGRAPH INDEX 560

PRE TEST LEAK CHECKS
 METER 5900 @ 16 in. Hg
 PITOTS V/V @ 23 in. Hg
 ORSAT /

P#	TIME	T _s °F	ΔP in H ₂ O	√ΔP	ΔH in H ₂ O	Vm ft ³	T _{min} °F	T _{out} °F	OVEN °F	IMP. OUT °F	VAC. (in Hg)
12	00	1600	0.01		3.6	064.021	70	71	N/A	68	7
11	2.5	1554	0.01		3.6	068.0	71	71		60	7
10	5.0	1552	0.01		3.6	041.0	72	71		58	7
9	7.5	1549	0.01		3.6	073.6	74	71		57	7
8	10.0	1597	0.01		3.6	076.3	74	71		58	7
7	12.5	1604	0.01		3.6	079.1	75	72		57	7
6	15.0	1549	0.01		3.6	081.7	76	72		58	7
5	17.5	1600	0.01		3.6	084.3	76	72		58	7
4	20.0	1609	0.01		3.6	087.0	77	73		57	7
3	22.5	1540	0.01		3.6	089.7	77	73		57	7
2	25.0	1552	0.01		3.6	092.3	77	73		58	7
1	27.5	1546	0.01	3.6	3.3	095.0	77	73		58	7
12	30.0	1565	0.01		3.6	097.826	73	72		62	7
11	32.5	1563	0.01		3.6	100.3	74	73		59	7
10	35.0	1577	0.01		3.6	102.8	74	73		57	7
9	37.5	1593	0.01		3.6	105.4	76	74		56	7
8	40.0	1591	0.01		3.6	108.0	76	73		56	7
7	42.5	1599	0.01		3.6	110.6	77	73		56	7
6	45.0	1586	0.01		3.6	113.4	77	73		56	7
5	47.5	1566	0.01		3.6	116.0	78	73		56	7
4	50.0	1570	0.01		3.6	118.7	79	74		56	7
3	52.5	1567	0.01		3.6	121.35	79	74		55	7
2	55.0	1570	0.01		3.6	124.0	79	74		56	7
1	57.5	1583	0.01		3.6	126.7	80	74		57	7
	60.0					129.407					
Avg.		1576.6		0.1000	3.60	64.386		74.3			

TIME END = 1200

Volume of Liquid Water Collected	Impinger Volume				Silica Gel Wght.
	1	2	3	4	5
Final	254	107	2		262.22
Initial	100	100	0		262
Liquid Collected					
Total Vol. Collected					173.0

POST TEST LEAK CHECKS
 Meter 40.001 @ 6 in. Hg
 Pitots @ in. Hg
 Orsat

Orsat Meas.	Time	CO ₂	O ₂	CO	N ₂
1					
2					
3					
Nozzle Cal	D ₁	D ₂	D ₃	Average	
				0.63	

**TOTAL COMBUSTION ANALYSIS
SCAQMD METHOD 25
FIELD SAMPLING DATA SHEET**

Job #: W07-039
Facility: Bradley L.F
Location: San Vally, CA
Date: 07/21/04
Operator: 7

Control Device: Flare/ Unit #3
Sample Location: OUTLET
Ambient Temp.: 64°F
Baro. Pressure: 29.07

SAMPLE A

Tank #: 56 Trap #: 18 H
Initial Vacuum: 30" 2.5 turn
Final Vacuum: 6"
Start Time: 0914

SAMPLE B

Tank #: 517 Trap #: 16 H
Initial Vacuum: 30" 2.5 turn
Final Vacuum: 6"
End Time: 1014

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	<u>30</u>	
05	<u>28</u>	
10	<u>26</u>	
15	<u>24</u>	
20	<u>22</u>	
25	<u>20</u>	
30	<u>18</u>	
35	<u>16</u>	
40	<u>14</u>	
45	<u>12</u>	
50	<u>10</u>	
55	<u>8</u>	
60	<u>6</u>	

TIME (min.)	VACUUM ("Hg)	FLOW (cc/min)
00	<u>30</u>	
05	<u>28</u>	
10	<u>26</u>	
15	<u>24</u>	
20	<u>22</u>	
25	<u>20</u>	
30	<u>18</u>	
35	<u>16</u>	
40	<u>14</u>	
45	<u>12</u>	
50	<u>10</u>	
55	<u>8</u>	
60	<u>6</u>	

LEAK RATE

Pre Test: ✓✓ 7
Post Test: ✓✓ 7

CEM TEMPERATURE DATA

Facility: Bradley / WM
 Job No.: W07-039
 Source: F-3

Date: 4/21/04
 Run #: 1 & 2

Probe Temp Settings: >250°F
 Heated Line Temp Settings: >250°F

		TEMPERATURES °F		
	Time	Condenser Outlet	Probe	Teflon Line
1	R1 00	34	>250°F	>250°F
2	10	34		
3	20	35		
4	30	35		
5	40	35		
6	50	36		
7	60	36		
8	R2 00	35		
9	10	35		
10	20	36		
11	30	36		
12	40	36		
13	50	36		
14	60	36		
15				

APPENDIX E - Calibration Information

Control Box Calibration Data

Date: 04/02/04

Calibrated by: Ferodie Jesus Orara Torres


Meter Box Number: 4

Barometric Pressure: 29.10

Wet Test Meter Cf: 0.9977

Orifice setting (H)	Gas Volumes			Temperatures			Time (min)	Y	H@
	Wet Test (cu.ft)	Dry Gas Initial (cu.ft)	Dry Gas Final (cu.ft)	DGM Initial (°F)	DGM final (°F)	WTM (°F)			
0.5	25.583	1040.859	1066.025	70	71	71	60	1.0110	1.6012
1.0	9.993	1030.875	1040.706	69	71	71	17	1.0087	1.6865
1.5	31.808	999.057	1030.666	70	70	71	45	0.9992	1.7446
2.0	17.831	980.951	998.611	71	73	70	22	1.0056	1.7601
3.0	21.313	959.500	980.562	70	73	70	21	1.0053	1.6822
4.0	61.283	898.889	959.264	65	73	69	53	1.0030	1.7296
AVERAGE								1.0055	1.7007

Reviewed by:



Control Box Calibration Data

Date: 04/01/04

Calibrated by: Ferodie Jesus Orara Torres

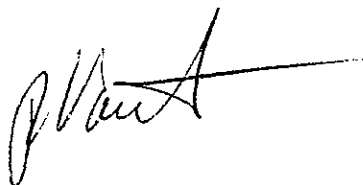
Meter Box Number: 7

Barometric Pressure: 29.15

Wet Test Meter Cf: 0.9971

Orifice setting (H)	Gas Volumes			Temperatures			Time (min)	Y	H@
	Wet Test (cu.ft)	Dry Gas Initial (cu.ft)	Dry Gas Final (cu.ft)	DGM Initial (°F)	DGM final (°F)	WTM (°F)			
0.5	10.860	481.057	491.805	77	79	72	24	1.0171	1.4058
1.0	10.554	470.230	480.784	79	81	72	17	1.0091	1.4881
1.5	23.823	446.051	469.930	79	82	71	32	1.0083	1.5450
2.0	30.126	415.545	445.746	79	83	71	35	1.0078	1.5396
3.0	16.789	398.167	415.011	79	84	71	16	1.0054	1.5526
4.0	13.344	384.495	397.891	76	83	71	11	0.9981	1.5553
AVERAGE								1.0076	1.5144

Reviewed by:



Magnehelic Gauge Calibration Data

Range: 0.0-1.00"

Date: 01/26/04

Calibrated by: Ferodie Jesus Orara Torres

BAROMETRIC PRESURE: 29.20

Reference: 0.0-10.0" MANOMETER

SYSTEM

LEAK CHECKS (Y/N): Y

POINT

LEAK CHECK (Y/N): Y

Magnehelic Box # 1

Serial # R970865M62

MAG	MAN R1	MAN R2	MAN R3	MEAN	MEAN/MAG
0.20	0.20	0.20	0.20	0.201	1.005
0.40	0.40	0.40	0.40	0.400	1.000
0.60	0.60	0.60	0.60	0.600	1.000
0.80	0.80	0.80	0.80	0.798	0.997
1.00	1.00	1.00	1.00	1.000	1.000

Correction Factor:

1.0004

Date: 1/27/04

Checked by: [Signature]

STACK TEMPERATURE SENSOR CALIBRATION DATA- APEX PROBE ASSEMBLIES

Date: 01/05-07/04

Calibrated by: Ferodie Jesus Orara Torres and Craig Moran

THERMOCOUPLE
ID:

	ICE WATER						ABSOLUTE T DIFF. %			BOILING WATER						ABSOLUTE T DIFF. %			BOILING OIL						ABSOLUTE T DIFF. %		
	REF			TC						REF			TC						REF			TC					
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Stainless Steel Probes																											
3-1	34	34	34	36	37	37	-0.4	-0.6	-0.6	212	212	212	212	212	212	0.0	0.0	0.0	448	448	448	446	447	447	0.2	0.1	0.1
4-2	34	34	34	34	35	35	0.0	-0.2	-0.2	212	212	212	214	214	214	-0.3	-0.3	-0.3	430	430	430	429	430	431	0.1	0.0	-0.1
4-3	34	34	34	34	35	35	0.0	-0.2	-0.2	212	212	212	213	214	214	-0.1	-0.3	-0.3	450	450	450	456	452	457	-0.7	-0.2	-0.8
6-2	33	33	33	34	33	33	-0.2	0.0	0.0	205	205	205	206	206	206	-0.2	-0.2	0.0	465	465	465	463	462	463	0.2	0.3	0.2
6-3	34	34	34	36	36	35	-0.4	-0.4	-0.2	212	212	212	212	212	213	0.0	0.0	-0.1	432	432	432	439	438	438	-0.8	-0.7	-0.7
6-4	33	33	33	34	35	34	-0.2	-0.4	-0.2	212	212	212	216	216	216	0.2	-0.6	-0.6	440	440	440	432	433	435	0.9	0.8	0.6
A6-5	34	34	34	34	34	34	0.0	0.0	0.0	212	212	212	215	214	214	-0.4	-0.3	-0.3	540	540	540	535	537	538	0.5	0.3	0.2
A8-1	34	34	34	34	34	34	0.0	0.0	0.0	212	212	212	214	215	214	-0.3	-0.4	-0.3	542	542	542	538	539	539	0.4	0.3	0.3
A8-2	34	34	34	34	34	34	0.0	0.0	0.0	212	212	212	215	215	215	-0.4	-0.4	-0.4	542	542	542	545	545	545	-0.3	-0.3	-0.3
10-1	34	34	34	35	35	35	-0.2	-0.2	-0.2	212	212	212	211	211	210	0.1	0.1	0.3	540	540	540	540	539	539	0.0	0.1	0.1
16-1	32	32	32	33	32	32	-0.2	0.0	0.0	212	212	212	212	212	212	0.0	0.0	0.0	529	529	529	529	529	530	0.0	0.0	-0.1
M17-1	33	33	33	34	33	33	-0.2	0.0	0.0	212	212	212	214	213	213	-0.3	-0.1	-0.1	450	450	450	448	446	447	0.2	0.4	0.3
M17-2	35	35	35	38	38	38	-0.6	-0.6	-0.6	212	212	212	214	213	213	-0.3	-0.1	-0.1	450	450	450	458	446	447	-0.9	0.4	0.3
M17-3	34	34	34	35	34	34	-0.2	0.0	0.0	200	200	200	198	199	200	0.3	0.2	0.0	460	460	460	458	461	460	0.2	-0.1	0.0
Inconel																											
10-2 Inc	34	34	34	34	34	34	0.0	0.0	0.0	212	212	212	211	211	210	0.1	0.1	0.3	540	540	540	540	539	539	0.0	0.1	0.1
6-1 Inc	32	32	32	33	33	32	-0.2	-0.2	0.0	212	212	212	213	213	213	-0.1	-0.1	-0.1	541	541	540	541	541	540	0.0	0.0	0.0
Loose Thermocouple																											
6-8	33	33	33	34	33	33	-0.2	0.0	0.0	212	212	212	211	212	212	0.1	0.0	0.0	450	450	450	452	453	452	-0.2	-0.3	-0.2
6-7	33	33	33	34	33	33	-0.2	0.0	0.0	200	200	200	198	199	198	0.3	0.2	0.3	465	465	465	461	465	463	0.4	0.0	0.2
7-2	34	34	34	34	34	33	0.0	0.0	0.2	212	212	212	211	211	211	0.1	0.1	0.1	450	450	450	451	451	451	-0.1	-0.1	-0.1
8-3	33	33	33	34	33	33	-0.2	0.0	0.0	212	212	212	211	212	212	0.1	0.0	0.0	450	450	450	451	451	450	-0.1	-0.1	0.0
Note: If absolute temperature values are desired, use the following formula: T (°C) = T (°F) - 32																											

Note: If absolute temperature values of the reference thermometer being calibrated and the stack temperature sensors agree within 1.5 percent at each of the three calibration points, no correction is needed.

PRAXAIR

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CERTIFICATE OF ANALYSIS

CUSTOMER HORIZON AIR MEASUREMENTS

DATE 03/11/04

P.O NUMBER

REF. NUMBER 15453700

REQUESTED COMPOSITION

GAS	CONCENTRATION
CARBON DIOXIDE	7 %
OXYGEN	12 %
NITROGEN	BALANCE
ANALYTICAL ACCURACY	±0.02%abs

ANALYTICAL METHOD

INSTRUMENT
METTLER ID5, S/N:1865166

ANALYTICAL PRINCIPLE
Gravimetric

Values not valid below 150 psig.

THIS CYLINDER NO.	SA 10110
CYLINDER PRESSURE	2000 PSIG
EXPIRATION DATE	03/11/07
CLASSIFICATION	PRIMARY STANDARD
BATCH NUMBER	N/A
LOT NUMBER	109331207
PART NUMBER	EV NICDOXP1-AS
CYLINDER SIZE	AS CGA 590 148 CFT

CERTIFIED CONCENTRATION

CARBON DIOXIDE	7.00 %
OXYGEN	11.98 %
NITROGEN	BALANCE
ANALYTICAL ACCURACY	±0.02%abs

ANALYZED BY

JACK FU

CERTIFIED BY

TY TRIPLETT

IMPORTANT

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CERTIFICATE OF ANALYSIS

CUSTOMER HORIZON AIR MEASUREMENTS

DATE 09/15/03

P.O NUMBER

REF. NUMBER 55946400

REQUESTED COMPOSITION

GAS	CONCENTRATION
CARBON DIOXIDE	12 %
NITROGEN	BALANCE
ANALYTICAL ACCURACY	±1 %

ANALYTICAL METHOD

INSTRUMENT
METTLER ID5, S/N:1865166

ANALYTICAL PRINCIPLE
GRAVIMETRIC

Values not valid below 150 psig.

THIS CYLINDER NO.	SA 17158
CYLINDER PRESSURE	2000 PSIG
EXPIRATION DATE	12/31/06
CLASSIFICATION	PRIMARY STANDARD
BATCH NUMBER	N/A
LOT NUMBER	109232903
PART NUMBER	EV NICD12P-AS
CYLINDER SIZE	AS CGA 580 145 CFT

CERTIFIED CONCENTRATION

CARBON DIOXIDE	11.98 %
NITROGEN	BALANCE
ANALYTICAL ACCURACY	±1 %

ANALYZED BY


JACK FU

CERTIFIED BY


VICTOR DOTAN

IMPORTANT

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CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR MEASUREMENTS

P.O. NUMBER

REFERENCE STANDARD

COMPONENT

NITRIC OXIDE GMIS

NIST SRM NO.

vs. SRM#1683

CYLINDER NO.

CC 95448

CONCENTRATION

22.4 ppm

ANALYZER READINGS

R=REFERENCE STANDARD

Z=ZERO GAS

C=GAS CANDIDATE

1. COMPONENT NITRIC OXIDE GMIS

ANALYTICAL PRINCIPLE

Chemiluminescence

ANALYZER MAKE-MODEL-S/N

Thermo Env. 42H S/N 42H-44979-273

FIRST ANALYSIS DATE

08/28/02

LAST CALIBRATION DATE

09/01/02

Z 0

R 22.3

C 20.1

CONC. 20.2

Z 0

SECOND ANALYSIS DATE

09/20/02

R 22.3

Z 0

C 20.2

CONC. 20.3

R 25.6

R 25.8

C 23.4

CONC. 20.3

Z 0

C 20.2

R 22.4

CONC. 20.2

Z 0

C 23.4

R 25.8

CONC. 20.3

U/M ppm

MEAN TEST ASSAY 20.2 ppm

U/M ppm

MEAN TEST ASSAY 20.3 ppm

NOx values for reference only.

All values not valid below 150 psig.

THIS CYLINDER NO.

CC 150203

HAS BEEN CERTIFIED ACCORDING TO SECTION

EPA-600/R97/121

CERTIFIED CONCENTRATION

OF TRACEABILITY PROTOCOL NO.

Rev. 9/97

NITRIC OXIDE

20.2 ppm

PROCEDURE

G1

NITROGEN

BALANCE

CERTIFIED ACCURACY

± 1

% NIST TRACEABLE

NOx

20.4 ppm

CYLINDER PRESSURE

2000 PSIG

CERTIFICATION DATE

09/20/02

EXPIRATION DATE

09/20/04

TERM 24 MONTHS

ANALYZED BY

MICHAEL TSANG

CERTIFIED BY

PHU TIEN NGUYEN

IMPORTANT

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user.

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR MEASUREMENTS

P.O NUMBER 8197

REFERENCE STANDARD

COMPONENT
NITRIC OXIDE

NIST SRM NO.
vs. SRM2628a

CYLINDER NO.
CC 137315

CONCENTRATION
9.50 ppm

ANALYZER READINGS

R=REFERENCE STANDARD

Z=ZERO GAS

C=GAS CANDIDATE

1. COMPONENT NITRIC OXIDE		ANALYZER MAKE-MODEL-S/N		Thermo Env. 42H S/N 42H-44979-273	
ANALYTICAL PRINCIPLE		CHEMILUMINESCENCE		LAST CALIBRATION DATE	
FIRST ANALYSIS DATE		05/05/03		SECOND ANALYSIS DATE	
Z 0	R 10.74	C 11.19	CONC. 9.90	Z 0.01	R 9.34
R 10.70	Z 0	C 11.20	CONC. 9.94	R 9.37	Z 0.01
Z 0	C 11.21	R 10.72	CONC. 9.93	Z 0.01	C 9.83
U/M ppm		MEAN TEST ASSAY	9.92	U/M ppm	
				MEAN TEST ASSAY	9.94

NOx = 9.93 ppm (For reference only).
All values not valid below 150 psig.

<p>THIS CYLINDER NO. CC 167634</p> <p>HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121</p> <p>OF TRACEABILITY PROTOCOL NO. Rev. 9/97</p> <p>PROCEDURE G1</p> <p>CERTIFIED ACCURACY ± 2 % NIST TRACEABLE</p> <p>CYLINDER PRESSURE 2000 PSIG</p> <p>CERTIFICATION DATE 06/06/03</p> <p>EXPIRATION DATE 06/06/05 TERM 24 MONTHS</p>	<p style="text-align: center;">CERTIFIED CONCENTRATION</p> <p>NITRIC OXIDE 9.93 ppm</p> <p>NITROGEN BALANCE</p>
--	--

ANALYZED BY

JOSEPH CHARLES

CERTIFIED BY

MICHAEL TSANG

IMPORTANT

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CERTIFICATE OF ANALYSIS

CUSTOMER HORIZON AIR MEASUREMENT

DATE 01/14/04

P.O NUMBER 8305

REF. NUMBER 58531700

REQUESTED COMPOSITION

GAS	CONCENTRATION
NITROGEN DIOXIDE (AS NOX)	19 ppm
NITROGEN	BALANCE
ANALYTICAL ACCURACY $\pm 1\%$	
NO	

ANALYTICAL METHOD

INSTRUMENT
Thermo Env. 42H S/N 42H-44979-273

ANALYTICAL PRINCIPLE
Chemiluminescence

VALUES NOT VALID BELOW 150 PSIG.

SRM UNCERTAINTY $\pm 1\%$

NO VALUE IS FOR REFERENCE ONLY.

THIS CYLINDER NO.	CC 118326
CYLINDER PRESSURE	2000 PSIG
EXPIRATION DATE	07/14/04
CLASSIFICATION	PRIMARY STANDARD
BATCH NUMBER	N/A
LOT NUMBER	109316003
PART NUMBER	EV NINX19MP-AS
CYLINDER SIZE	AS CGA 660 140 CFT

CERTIFIED CONCENTRATION

NITROGEN DIOXIDE (AS NOX)	18.9 ppm
NITROGEN	BALANCE
ANALYTICAL ACCURACY $\pm 1\%$	
NO 0.5 ppm	

ANALYZED BY

JOSEPH CHARLES

CERTIFIED BY

MICHAEL TSANG

IMPORTANT

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc. extend out of the state of California.

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CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR MEASUREMENTS

P.O NUMBER 8078

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE GMIS	vs.SRM#1679	CC 81440	99.1 ppm
NITRIC OXIDE GMIS	vsSRM#1684b	CC 115392	100.0 ppm

ANALYZER READINGS

R=REFERENCE STANDARD

Z=ZERO GAS

C=GAS CANDIDATE

1. COMPONENT CARBON MONOXIDE GMIS		ANALYZER MAKE-MODEL-S/N Siemens Ultramat 5E S/N A12-729	
ANALYTICAL PRINCIPLE NDIR		LAST CALIBRATION DATE 11/14/02	
FIRST ANALYSIS DATE 12/02/02		SECOND ANALYSIS DATE 12/10/02	
Z 0.0	R 99.1	C 80.2	CONC. 80.2
R 99.1	Z 0.0	C 80.2	CONC. 80.2
Z 0.0	C 80.2	R 99.1	CONC. 80.2
U/M ppm		MEAN TEST ASSAY 80.2 ppm	
2. COMPONENT NITRIC OXIDE GMIS		ANALYZER MAKE-MODEL-S/N Beckman 951A S/N 0101354	
ANALYTICAL PRINCIPLE Chemiluminescence		LAST CALIBRATION DATE 12/08/02	
FIRST ANALYSIS DATE 12/02/02		SECOND ANALYSIS DATE 12/10/02	
Z 0.0	R 873.4	C 707.2	CONC. 81.0
R 874.6	Z 0.0	C 711.2	CONC. 81.3
Z 0.0	C 712.4	R 875.6	CONC. 81.4
U/M mV		MEAN TEST ASSAY 81.2 ppm	

Values not valid below 150 psig.
NOx values for reference use only.

THIS CYLINDER NO. CC 92871

HAS BEEN CERTIFIED ACCORDING TO SECTION

EPA-600/R97/121

OF TRACEABILITY PROTOCOL NO.

Rev. 9/97

PROCEDURE G1

CERTIFIED ACCURACY ± 1 % NIST TRACEABLE

CYLINDER PRESSURE 2000 PSIG

CERTIFICATION DATE 12/10/02

EXPIRATION DATE 12/10/04 TERM 24 MONTHS

CERTIFIED CONCENTRATION

CARBON MONOXIDE	80.2 ppm
NITRIC OXIDE	81.2 ppm
NITROGEN	BALANCE
NOx	81.6 ppm

ANALYZED BY

CHRIS VU

CERTIFIED BY

HELENA TRAN

IMPORTANT

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any particular purpose. The information is offered with the understanding that any use of the information is at the sole discretion of the user.

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PRAXAIR

Praxair
5700 South Alameda Street
Los Angeles, CA 90058
Telephone: (323) 585-2154
Facsimile: (714) 542-6689

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

CUSTOMER HORIZON AIR

P.O NUMBER 8354

REFERENCE STANDARD

COMPONENT	NIST SRM NO.	CYLINDER NO.	CONCENTRATION
CARBON MONOXIDE GMIS	VS.SRM#1678	CC 81679	51.1 PPM
NITRIC OXIDE GMIS	VS.SRM#1683b	CC 137710	48.0 ppm

ANALYZER READINGS

R=REFERENCE STANDARD

Z=ZERO GAS

C=GAS CANDIDATE

1. COMPONENT	CARBON MONOXIDE GMIS	ANALYZER MAKE-MODEL-S/N	Siemens Ultramat 5E S/N A12-729
ANALYTICAL PRINCIPLE	NDIR		
FIRST ANALYSIS DATE	03/19/04		LAST CALIBRATION DATE 03/01/04
			SECOND ANALYSIS DATE 03/26/04
Z 0.0 R 50.2 C 50.2	CONC. 50.2	Z 0.0 R 51.1 C 50.2	CONC. 50.2
R 50.2 Z 0.0 C 50.2	CONC. 50.2	R 51.1 Z 0.0 C 50.2	CONC. 50.2
Z 0.0 C 50.2 R 50.2	CONC. 50.2	Z 0.0 C 50.2 R 51.1	CONC. 50.2
U/M ppm	MEAN TEST ASSAY 50.2 ppm	U/M ppm	MEAN TEST ASSAY 50.2 ppm
2. COMPONENT	NITRIC OXIDE GMIS	ANALYZER MAKE-MODEL-S/N	BECKMAN 951A S/N#0101354
ANALYTICAL PRINCIPLE	CHEMILUMINESCENCE		
FIRST ANALYSIS DATE	03/19/04		LAST CALIBRATION DATE 03/01/04
			SECOND ANALYSIS DATE 03/26/04
Z 0.0 R 458.5 C 477.0	CONC. 49.9	Z 0.0 R 457.5 C 477.0	CONC. 50.0
R 458.7 Z 0.0 C 477.3	CONC. 49.9	R 457.4 Z 0.0 C 477.6	CONC. 50.1
Z 0.0 C 477.5 R 459.4	CONC. 49.9	Z 0.0 C 476.8 R 457.5	CONC. 50.0
U/M mV	MEAN TEST ASSAY 49.9 ppm	U/M mV	MEAN TEST ASSAY 50.0 ppm

NOx VALUE FOR REFERENCE USE ONLY. ALL VALUES NOT VALID BELOW 150 psig.
FIRST CO ASSAY DONE AGAINST G.M.I.S.# CC 81679 (50.2 ppm CO/N2).

THIS CYLINDER NO. CC 100039
HAS BEEN CERTIFIED ACCORDING TO SECTION EPA-600/R97/121
OF TRACEABILITY PROTOCOL NO. Rev. 9/97
PROCEDURE G1
CERTIFIED ACCURACY ± 1 % NIST TRACEABLE
CYLINDER PRESSURE 2000 PSIG
CERTIFICATION DATE 03/26/04
EXPIRATION DATE 03/26/06 TERM 24 MONTHS

CERTIFIED CONCENTRATION
CARBON MONOXIDE 50.2 ppm
NITRIC OXIDE 50.0 ppm
NITROGEN BALANCE
NOx 50.4 ppm

ANALYZED BY

CHRIS VU

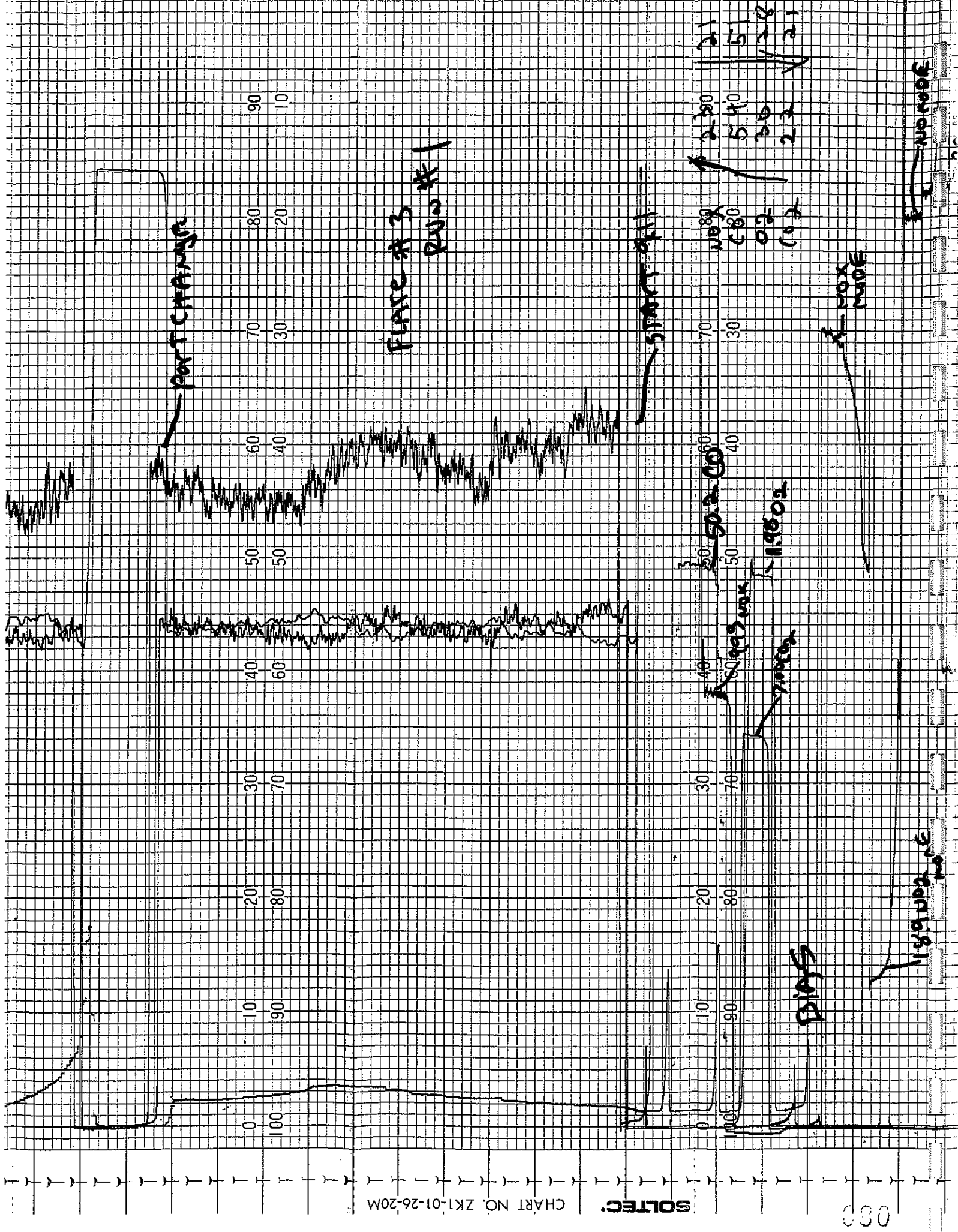
CERTIFIED BY

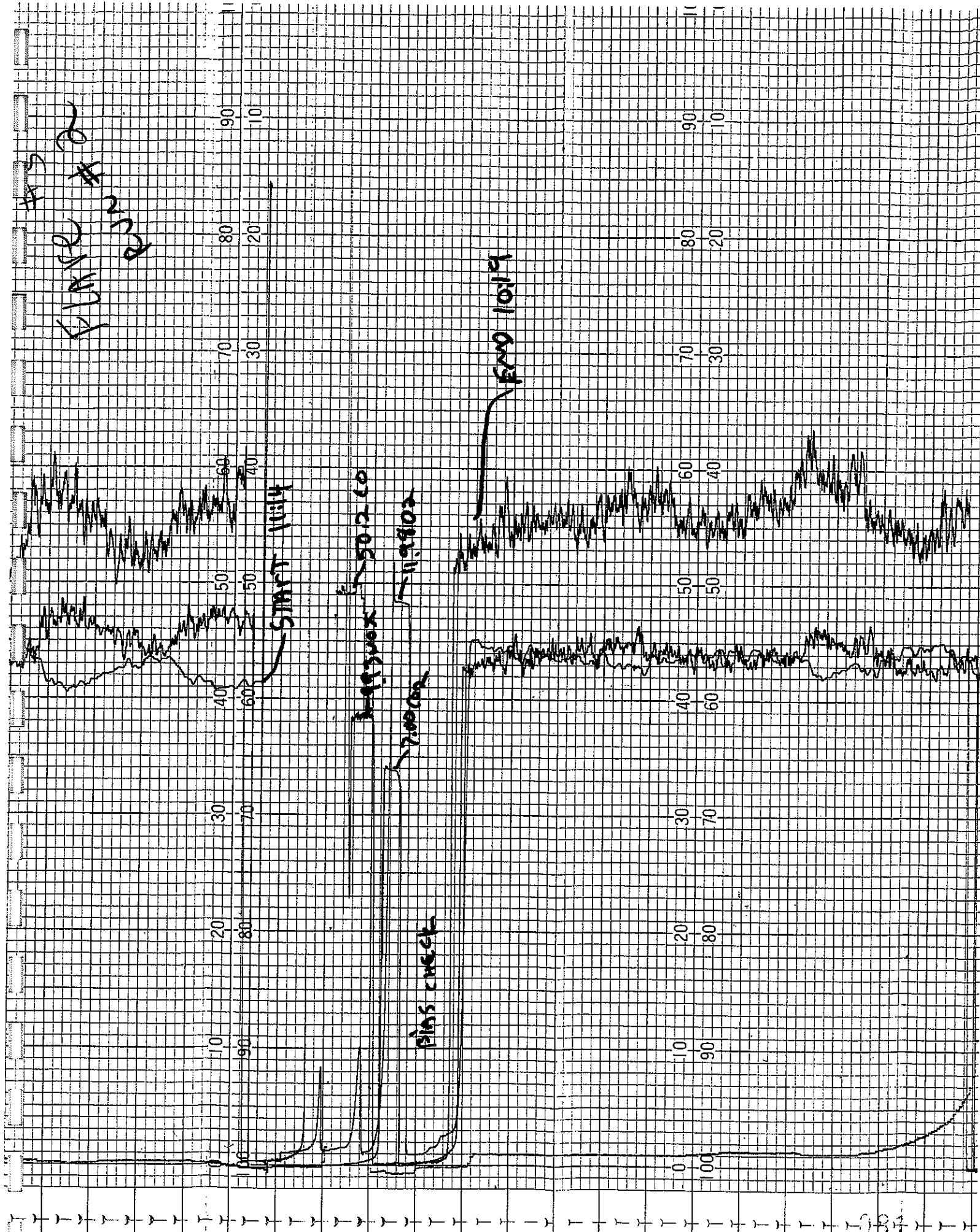
HELENA TRAN

IMPORTANT

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APPENDIX F - Strip Chart Data





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50.2 CO

9.13 max

11.8 CO2

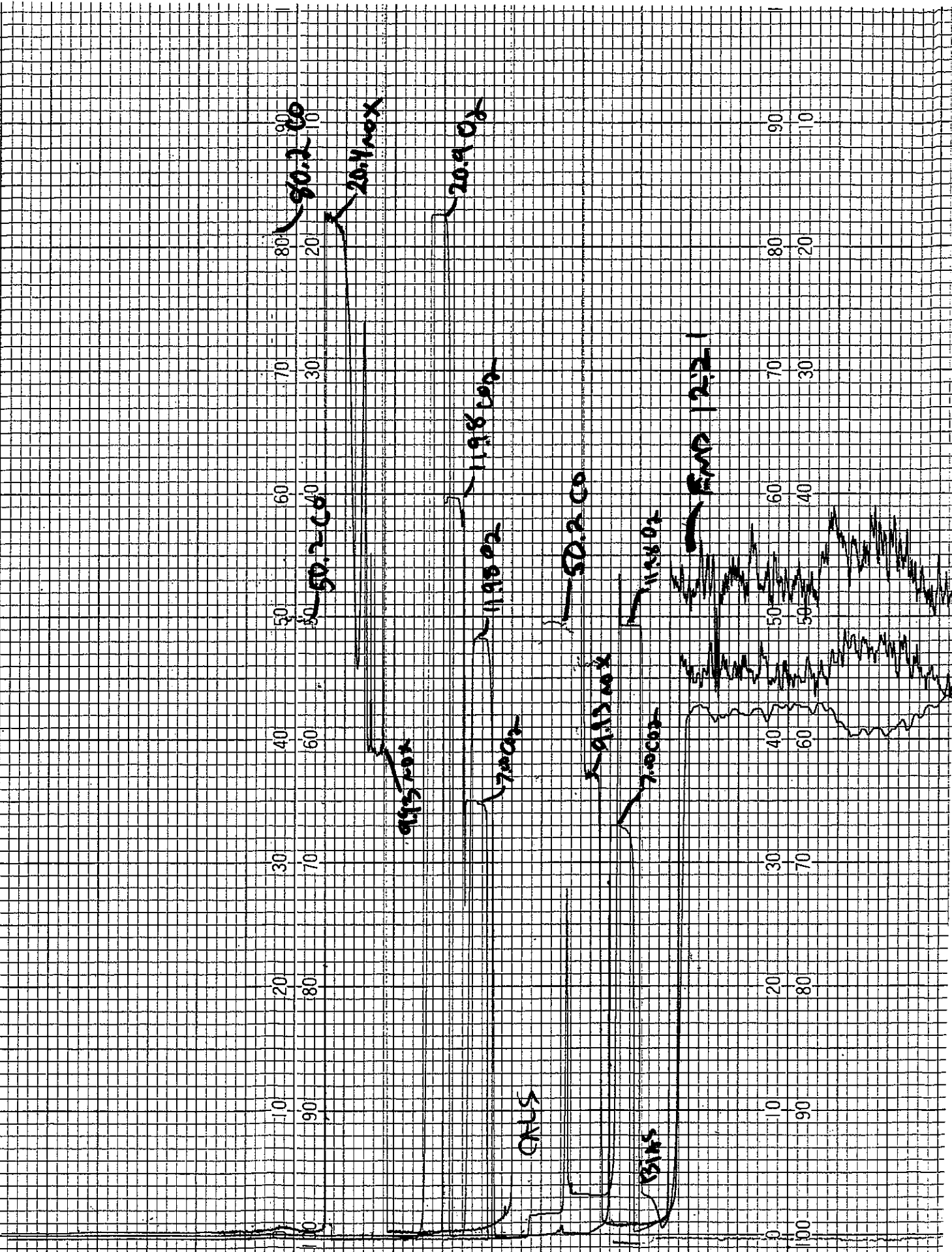
END 12.2

7.0 CO2

BINS

PORT CHARGE

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APPENDIX G - Process Data

LFG Flow #3 operating Data

ndel
(Wark)

	LFG Flow, CFM	T °F	Concl., ppm
0911	1920	1567	2.3
0916	1909	1567	2.4
0921	1910	1576	2.3
0926	1926	1588	2.3
0931	1915	1557	2.2
0936	1914	1576	2.2
0941	1941	1585	2.3
0946	1938	1564	2.3
0953	1947	1576	2.3
0958	1945	1567	2.3
1003	1944	1581	2.3
1008	1931	1583	2.3
1013	1960	1586	2.3
1018	1939	1569	2.3
	1931	1574	2.3
1114	1942	1543	2.3
1119	1953	1560	2.2
1124	1961	1563	2.3
1129	1955	1582	2.2
1134	1951	1591	2.3
1139	1944	1587	2.3
1144	1946	1561	2.2
1149	1935	1555	2.3
1154	1935	1595	2.2
1159	1930	1584	2.2
1204	1920	1570	2.2
1209	1916	1572	2.2
1214	1855	1571	2.2
1219	1923	1583	2.0
	1930	1576	2.2

APPENDIX H - Permit to Operate



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CONTINUATION OF PERMIT TO CONSTRUCT/OPERATE

- 5) WHENEVER THE FLARE IS IN OPERATION, EXCEPT DURING START-UP, A TEMPERATURE OF NOT LESS THAN 1400 DEGREES F, AS MEASURED BY THE TEMPERATURE INDICATOR AND RECORDER, SHALL BE MAINTAINED IN THE FLARE STACK. THE THERMOCOUPLE USED TO MEASURE THE TEMPERATURE SHALL BE ABOVE THE FLAME ZONE AND AT LEAST 3 FEET BELOW THE TOP OF THE FLARE SHROUD AND AT LEAST 0.6 SECONDS DOWNSTREAM OF THE BURNER.
- 6) A FLOW INDICATING AND RECORDING DEVICE SHALL BE MAINTAINED IN THE LANDFILL GAS SUPPLY LINE TO THE FLARE TO MEASURE AND RECORD THE QUANTITY OF LANDFILL GAS (IN SCFM) BEING BURNED.
- 7) THE TOTAL VOLUME OF LANDFILL GAS BURNED IN THE FLARE SHALL NOT EXCEED 2,083 CUBIC FEET PER MINUTE.
- 8) WHENEVER THE CONDENSATE INJECTION STATION IS IN OPERATION, NOT MORE THAN 5 GALLONS PER MINUTE OF CONDENSATE SHALL BE INJECTED INTO THE FLARE.
- 9) A FLOW INDICATOR AND RECORDER SHALL BE INSTALLED AT EACH CONDENSATE INJECTION STATION AND SHALL OPERATE WHENEVER THE CONDENSATE INJECTION STATION IS IN OPERATION.
- 10) ALL RECORDING DEVICES SHALL BE SYNCHRONIZED WITH RESPECT TO THE TIME OF DAY.
- 11) THE FLARE SHALL BE EQUIPPED WITH A FLARE FAILURE ALARM WITH AN AUTOMATIC BLOWER SHUT-OFF SYSTEM.
- 12) THE FLARE FAILURE ALARM WITH THE AUTOMATIC BLOWER SHUT-OFF SYSTEM SHALL BE TESTED ANNUALLY FOR PROPER OPERATION AND RESULTS RECORDED.
- 13) A PRESSURE DIFFERENTIAL INDICATOR SHALL BE MAINTAINED ACROSS THE FLAME ARRESTOR.
- 14) A SUFFICIENT NUMBER OF SIGHT GLASS WINDOWS SHALL BE INSTALLED IN THE FLARE TO ALLOW VISUAL INSPECTION OF THE FLAME AND THERMOCOUPLE LOCATION WITHIN THE FLARE AT ALL TIMES. ADEQUATE AND SAFE ACCESS SHALL BE PROVIDED FOR ALL PORTS UPON REQUEST BY AQMD PERSONNEL.
- 15) A SET OF FOUR SAMPLING PORTS SHALL BE INSTALLED IN THE FLARE SHROUD AND LOCATED AT LEAST TWO FEET ABOVE THE FLAME ZONE AND AT LEAST THREE FEET BELOW THE TOP OF THE FLARE SHROUD. EACH PORT SHALL BE INSTALLED AT 90 DEGREES APART AND SHALL CONSIST OF FOUR INCH COUPLINGS. ADEQUATE AND SAFE ACCESS TO ALL TEST PORTS SHALL BE PROVIDED BY THE APPLICANT WITHIN 24 HOURS OF A REQUEST BY THE AQMD TO CONDUCT A TEST.
- 16) A SAMPLING PORT, OR OTHER METHOD APPROVED BY THE AQMD, SHALL BE INSTALLED AT THE INLET GAS LINE TO THE FLARE.

ORIGINAL



PERMIT TO CONSTRUCT/OPERATE

CONTINUATION OF PERMIT TO CONSTRUCT/OPERATE

- 17) THE SKIN TEMPERATURE OF THE FLARE SHROUD WITHIN FOUR FEET OF ALL THE SOURCE TEST PORTS SHALL NOT EXCEED 250 DEGREES F. IF A HEAT SHIELD IS REQUIRED TO MEET THIS REQUIREMENT, ITS DESIGN SHALL BE APPROVED BY THE AQMD PRIOR TO CONSTRUCTION. THE HEAT SHIELD, IF REQUIRED TO MEET THE TEMPERATURE REQUIREMENT, SHALL BE IN PLACE WHENEVER A SOURCE TEST IS CONDUCTED BY THE AQMD.
- 18) THE APPLICANT SHALL CONDUCT A SOURCE TEST ANNUALLY OR PER THE APPROVED 1150.1 COMPLIANCE PLAN. THE TEST SHALL BE PERFORMED IN ACCORDANCE WITH AQMD APPROVED TEST PROCEDURES. THE TEST SHALL INCLUDE, BUT MAY NOT BE LIMITED TO, A TEST OF THE FLARE FOR:
- A. LANDFILL GAS COMPOSITION AND HEATING VALUE (INLET)
 - B. LANDFILL GAS FLOW RATE, SCFM (INLET)
 - C. TOTAL SULFUR COMPOUNDS AS H₂S, PPMV (INLET)
 - D. TEMPERATURE, F (EXHAUST)
 - E. FLOW RATE, DSCFM (EXHAUST)
 - F. NOX, LBS/HR AND LBS/MMBTU (EXHAUST)
 - G. SOX, LBS/HR (EXHAUST)
 - H. CO, LBS/HR (EXHAUST)
 - I. PM, LBS/HR AND GR/DSCF (EXHAUST)
 - J. TOTAL NON-METHANE ORGANICS, LBS/HR (INLET AND EXHAUST)
 - K. RULE 1150.1 TOXIC COMPOUNDS, PPMV (INLET AND EXHAUST)
- 19) EMISSIONS OF NOX FROM THE FLARE SHALL NOT EXCEED 0.06 LBS PER MILLION BTU OF HEAT.
- 20) ANY BREAKDOWN OR MALFUNCTION OF THE LANDFILL GAS FLARE RESULTING IN THE EMISSION OF RAW LANDFILL GAS SHALL BE REPORTED TO THE AQMD WITHIN ONE HOUR OF OCCURRENCE, AND IMMEDIATE REMEDIAL MEASURES SHALL BE UNDERTAKEN TO CORRECT THE PROBLEM AND PREVENT FURTHER EMISSIONS INTO THE ATMOSPHERE.
- 21) EMISSIONS RESULTING FROM FLARE NO. 3 SHALL NOT EXCEED THE FOLLOWING:
- | | |
|------|---------------|
| ROG | 0.66 LBS/HR ✓ |
| NOx | 2.58 LBS/HR ✓ |
| SOx | 3.16 LBS/HR ✓ |
| CO | 2.37 LBS/HR ✓ |
| PM10 | 1.31 LBS/HR ✓ |
- 22) ALL RECORDS SHALL BE KEPT FOR A PERIOD OF AT LEAST TWO (2) YEARS AND SHALL BE MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST. A RECORD OF THE HOURS OF FLARE OPERATION SHALL BE INCLUDED.
- 23) FLARE START-UP TIME SHALL NOT EXCEED 30 MINUTES. ANY OUTAGE THAT RESULTS IN THE SHUTDOWN OF THE FLARE SHALL NOT BE CONSIDERED A BREAKDOWN PROVIDING NO EMISSION OF RAW LANDFILL GAS OCCURS.

ORIGINAL



SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 East Copley Drive, Diamond Bar, CA 91765

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CONTINUATION OF PERMIT TO CONSTRUCT/OPERATE

- 24) MITIGATION MEASURES, OTHER THAN THOSE INDICATED IN THESE CONDITIONS, WHICH ARE DEEMED APPROPRIATE BY AQMD PERSONNEL AS NECESSARY TO PROTECT THE COMFORT, REPOSE, HEALTH OR SAFETY OF THE PUBLIC, SHALL BE IMPLEMENTED UPON REQUEST.

NOTICE

IN ACCORDANCE WITH RULE 206, THIS PERMIT TO OPERATE OR COPY SHALL BE POSTED ON OR WITHIN 8 METERS OF THE EQUIPMENT.

THIS PERMIT DOES NOT AUTHORIZE THE EMISSION OF AIR CONTAMINANTS IN EXCESS OF THOSE ALLOWED BY DIVISION 26 OF THE HEALTH AND SAFETY CODE OF THE STATE OF CALIFORNIA OR THE RULES OF THE AIR QUALITY MANAGEMENT DISTRICT. THIS PERMIT CANNOT BE CONSIDERED AS PERMISSION TO VIOLATE EXISTING LAWS, ORDINANCES, REGULATIONS OR STATUTES OF OTHER GOVERNMENT AGENCIES.

EXECUTIVE OFFICER

Dorris M. Bailey

By Dorris M. Bailey/tk01
6/07/2000

ORIGINAL

